

A Multidisciplinary Approach to Understanding and Preventing Broken Chains

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Background

- Individuals continually face a range of stimuli competing for our attention
- Inevitably we become distracted → this may prevent us from completing a task
 - This is a Broken Chain
- A behavioral chain is made up of a series of sequences of actions.
- A sequence, one of the links in the chain, is characterized as actions made up of multiple steps.
- Chain behavior can include many more chains but there are a few key rules:
 1. Each step of the sequence must be completed in order before moving onto the next sequence.
 2. Completion of all the sequences leads to the completion of the entire chain of behavior.
 3. The order you the sequences does not matter but the order of the steps within the sequence does matter
- A **broken chain** happens when there is a failure to complete one of the steps in the chain. This impedes the completion of a specific sequence and inhibits the momentum of taking the entire series of sequences forward

When is a Task is “Too Complex”?

- A task becomes more horizontally complex when the total number of steps and sequences increases.
 - This does not necessarily mean that the steps themselves become more challenging.
- Commons, et al. (1998) defines a task as hierarchically complex if the task can be defined in terms of at least two simpler tasks and the tasks can be combined or reorganized in a non-arbitrary way.
 - This “nesting” of lower order tasks within higher order tasks is called concatenation.
- For example, one might easily add or multiply numbers with many digits in them but when they confront a distributivity problem such as $55(32 + 52)$, they may not initially know how to successfully solve it.
 - Not easily knowing how to solve the distributivity problem could be sufficient cause for an interruption in task completion, resulting in a broken chain.
- When there is an interruption because the attempts to complete a task successfully fail, the individual may become discouraged and experience fatigue.
 - This is especially true if the individual feels their energy was wasted after not completing a step in their first attempt
- Once attention has been diverted from the primary task, there is a chance the individual may take advantage of this break and turn to another peripheral task instead of refocusing

Interruptions Effect on Chain Behavior

The phases of an interruption:

1. The Preparation Phase: the time between an alert and concomitant suspension of the ongoing task
2. The diversion phase: the time between the switch to the disruption and the return to the primary task
3. The resumption phase: when the individual completes the interruption/peripheral activity and returns to the primary goal (Iqbal & Horvitz, 2007)

There are moments or boundaries throughout a task that offers natural pauses or breaks (Iqbal & Bailey, 2005)

- An interruption at one of these boundaries is going to be less disruptive than at moments of heavy workload → less likely to result in a broken chain
- The use of breaks and breaking tasks down into subtasks can minimize the negative effects of interruptions and thus prevent a broken chain

Breaks are Important

- Human energy is an affective experience that includes a sense of positive arousal, eagerness to act, and the capability to act (Quinn & Dutton, 2005).
- It is a “reinforcing experience that people enjoy and seek” (Dutton, 2003, p. 6) and is reflected in an individual’s experience of vitality and lack of fatigue.
- Conservation of resources (COR) theory posits that individuals strive to protect and acquire resources because losing resources is distressing (Bosch & Sonnentag, 2018; Kim, Park, & Niu, 2017; Fritz, Lam, & Spreitzer, 2011)
- When individuals stop working on a task and engage in a recovery activity, this can help them return to baseline functioning (Kim, Park, & Niu, 2017)
- Factors that have reduced opportunities for individuals to recover their energy
 - Long work hours
 - More employees are electronically “tethered” to work via smartphones and are obliged to respond to calls and emails outside of normal work hours.
 - Heightened job insecurity and work furloughs can induce a sense of uncertainty that makes employees less inclined to take time off.

(Fritz et al., 2011)

- These factors make it even harder to take evenings and weekends to unwind and recharge, a condition key to wellbeing in the home and the workplace.

Interruptions	Break Taking
<ul style="list-style-type: none"> • An interruption is unplanned • We often try to limit the number of distractions and possible interruptions. • A peripheral distraction causes a greater anxiety when presented during a primary task rather than just after task completion (Bailey et al., 2001) • Miyata & Norman (1986) theorized an interruption at a moment of low mental workload will have a lower cost-effect than if it occurs in the middle of a step 	<ul style="list-style-type: none"> • A microbreak is an informal break that is self-directed • Short breaks can increase levels of engagement (Sonnentag, 2003) • The need for recovery and the desire for self-reward is directly related to the taking of breaks (Bosch & Sonnentag, 2018) • Microbreaks are associated with higher energy following the break, buffers against negative work demands, and relates to job performance, work engagement, and off the job recovery experiences

When to take a Mircobreak or Work-Related Break

Microbreak	Work-Related Break
<ul style="list-style-type: none"> • A microbreak is a form of energy management that does not directly relate to doing work (e.g. having a snack, going for a walk). • microbreaks have a positive short-term effect on momentary occupational well-being 	<ul style="list-style-type: none"> • Work-related strategies are done to manage an individual’s energy (e.g. switching tasks, making a to do list). • Bosch & Sonnentag (2018) proposed that people engage in a work-related break when they fear they may not be able to return the primary task if they were to take a microbreak.

Both a microbreak and work-related break can easily become an indefinite break if the individual never returns to the original chain behavior.

- It is during these moments that a broken chain is most likely to occur.

Breaking Tasks Down

- The sequences of chain behavior can seem complex and daunting but breaking the chain down into sequences (macrotasks) and subsequent microtasks can help to reduce stress
- While microtasks can create overall longer completion times, it can produce higher quality work and a more positive experience that build resilience to interruptions and other distractions.
 - Cheng et al (2015) reported that an average of 77% of participants in their study even preferred microtasks over macrotasks
- The way in which these microtasks are chained (the order) effect the extent to which people complete tasks productively and continue to engage in the task.

Why Do Chains Break?

Chains break when the individual starts to lose motivation to complete the chain behavior

Internal and external motivation (Deci & Ryan, 2000; Nishimura & Sakurai, 2017)

- Internal motivation comes from a place of genuine curiosity and satisfaction from the process of competing or achieving a goal.
- External motivation describes a behavior that is externally motivated, such as wanting to gain a reward or avoiding a punishment (Guay, Bureau, Litalie, et al., 2019)

Self-concordance or non-concordance (Sheldon, Elliot, Ryan, et al., 2004)

- A self-concordant goal is one that is aligns with an individual’s beliefs and reflects their authentic choice
- A non-concordant goal is one that an individual feels they “must do” or the goal may go against their own personal beliefs

Imagine... the possible chains behavior of an Undergraduate Student

