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# Push Notifications for User Retention in Personal Growth Apps: A Comparative Case Study of Headspace and 7Mind

**Authors:**

Tim Homfeldt
University of Applied Sciences Wedel, Wedel, Germany
ORCiD: 0009-0009-3906-0522

Philipp Kähler
University of Applied Sciences Wedel, Wedel, Germany

**Abstract:**

Within the rapidly growing sector of mobile health (mHealth), and in the context of a rising number of mental health issues, Personal Growth Applications have emerged as vital tools for enhancing psychological well-being and personal development. Sustaining long-term user retention remains a persistent challenge. Push notifications are considered a key instrument for fostering user engagement and retention. Their effectiveness, however, depends on how they are implemented and can, if poorly managed, have negative effects on user acceptance. This study examines how push notifications should be used to foster user retention in personal growth apps and how this is actually implemented in practice. A qualitative comparative case study of the global market leader Headspace and the German provider 7Mind was conducted. Based on a structuring content analysis following Mayring's framework, all incoming push notifications were systematically documented through personal use over a six-week period, resulting in a total dataset of 143 notifications. The evaluation was based on five quality factors derived from the literature: personalization, content relevance and quality, frequency, timing, and user control. The findings reveal two contrasting communication logics. Headspace pursues a hybrid approach with partial personalization, daily content variation, and two notifications per day. 7Mind follows a standardized strategy that largely lacks personalization, features repetitive content, and sends a daily notification. Both providers rely on static, time-based delivery rather than dynamic, context-sensitive triggering, although both offer user configuration options. The study concludes that push notifications in personal growth apps should be understood less as mass communication and more as individually tailored triggers, whose effectiveness depends on aligning with the user's motivation, ability to act, and context. Since both providers rely on static time-based delivery, future research should examine dynamic, context-aware trigger mechanisms and their impact on long-term retention.

**Keywords:**

mHealth, Personal Growth App, Push Notification, 7Mind, Headspace

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## Introduction

In an increasingly digitalized world, mobile applications (apps) promoting mental health and personal growth have gained critical importance. The World Health Organization (WHO) reports that over one billion people globally live with mental health conditions, a challenge compounded by severe resource shortages in traditional healthcare delivery (World Health Organization (WHO), 2025). This global demand has catalyzed a rapidly expanding commercial sector. The global mental health app market, valued at approximately 6.1 billion USD in 2023, is projected to reach 26.5 billion USD by 2032 (Global Market Insights, 2025). Within this landscape, self-help and stress management applications represent a vital segment aimed at fostering psychological well-being and personal development.

Mindfulness and meditation apps represent a specific category within personal growth apps (East & Havard, 2015). Regular use is crucial for their therapeutic success, such as in reducing stress (by about 27%) or anxiety (Grand View Research, 2025; O'Daffer et al., 2022). Despite rising download numbers and widespread availability on iOS and Android platforms, mHealth apps face the major challenge of retaining users over the long term. Studies suggest that apps are quickly uninstalled or ignored if the user interaction is perceived as unengaging or even intrusive (Morrison et al., 2017).

Push notifications are a key instrument for engaging users. They have the potential to increase exposure to intervention content through timely reminders (Morrison et al., 2017). Nevertheless, a critical conflict exists. While personalized and context-sensitive notifications can strengthen engagement, unstructured or overly frequent alerts often lead to digital stress and reactance (Global Market Insights, 2025; Morrison et al., 2017). Push notifications can be perceived as disruptive.

While research has examined the effectiveness of various push notification elements, such as timing, frequency, and personalization, in mHealth and mental health apps (Bidargaddi et al., 2018; Morrison et al., 2017; Pham et al., 2016), the subcategory of personal growth apps remains underexamined, and comparative analyses between global and regional providers remain largely unexplored. This study addresses these gaps by conducting a comparative case study analyzing the distinct communication logics deployed by the global market leader, Headspace, and the German provider, 7Mind. By analyzing their real-world notification practices against the theoretical recommendations identified in the literature, this study addresses the following research questions:

1. How should push notifications be used to promote user retention in personal growth apps?
2. How are push notifications implemented in practice in personal growth apps?

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# Literature Review and Theoretical Framework

## Definition and Concepts of mHealth

mHealth is a subset of electronic Health (eHealth) (Mechael, 2009; WHO, 2013). eHealth refers to the internet-based organization and delivery of healthcare services (Eysenbach, 2001). eHealth aims to improve healthcare at the local, regional, and global levels through the use of information and communication technology. The term mHealth specifically refers to the use of mobile devices, such as mobile phones and other wireless devices, to collect real-time data in medical practice and public health (Almotiri et al., 2016). mHealth apps have transformed the way people manage their personal health by providing direct access to health services (Krishnan et al., 2025). According to the IQVIA Institute, there were approximately 350,000 mHealth apps in December 2020 (Baumgartner et al., 2021). mHealth apps are frequently used to provide information on the treatment and prevention of diseases and also proved to be an effective tool for sending reminders (Bervell & Al-Samarraie, 2019). These apps can be categorized into wellness apps, such as exercise and fitness or lifestyle and stress management, and health monitoring apps, such as medication reminders or disease monitoring. Wellness apps aren't necessarily designed to prevent specific illnesses, but rather to encourage users to adopt a healthy lifestyle (Olla & Shimskey, 2015).

## Mental Health and Personal Growth Apps

Mental health is an important part of a healthy life (Prince et al., 2007; WHO, 2013). Mental health apps are designed to support and improve mental health (Neary & Schueller, 2018). There are over 10,000 mental Health Apps for different cases (Alqahtani & Orji, 2020). Examples of use cases include meditation, symptom tracking, and coaching. In addition to improving overall mental health, these also include areas such as cognitive learning and personal growth (East & Havard, 2015). Personal growth is an important factor for the psychological well-being of a person (Compton, 2001). It describes the changing and developing process as a person (Robitschek, 1998). In order to harness the potential of these apps and ensure they have a positive impact on mental health, the challenge lies in finding a way to encourage people to use them (Garrido et al., 2019).

## Push Notifications in Personal Growth Apps

Push notifications are a key feature of smartphone communication that allows apps to immediately notify users of updates, messages, or instructions (Freyne et al., 2017; Warren et al., 2014). Their primary purpose in mobile applications is to keep users informed of relevant changes and ensure timely interaction with the content (Warren et al., 2014).

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In digital interventions, push notifications are considered an effective tool for increasing engagement and retention (Amagai et al., 2022). In mHealth research, engagement and user retention are understood as closely interrelated concepts that are often even used interchangeably. A lack of engagement is considered a key reason for discontinuation and, consequently, for low user retention. Studies show that notifications about new messages, in particular, can significantly increase interaction rates (Pham et al., 2016). In the case of health-related apps, regular notifications encourage users to engage with the content without necessarily having a negative impact on their willingness to use the app (Morrison et al., 2017). The effectiveness of push notifications depends largely on the relevance of their content and the degree to which they are personalized, as the likelihood of a response varies significantly depending on individual user behavior. This underscores the need to tailor the content and context of notifications to the specific user group in order to achieve the greatest possible impact (Bidargaddi et al., 2018).

Although push notifications can increase user engagement, they also carry risks. In the literature, every notification is viewed as an interruption that places a cognitive burden on the user (Fischer et al., 2010). Poor management, through inappropriate timing, lack of added value, or excessive frequency, can transform notifications from a benefit into a burden (Gavilan & Martinez-Navarro, 2022). Messages like these, which are perceived as intrusive, lead to reactance and can cause lasting damage to customer retention (Pham et al., 2016).

To maximize the effectiveness of push notifications in personal growth apps and avoid issues such as alert or push fatigue (Aliakbari et al., 2026; Khanday et al., 2025), the literature identifies various quality factors. In line with the Fogg Behavior Model (Fogg, 2009) these aim to design push notifications as effective triggers. The Fogg Model posits that a desired behavior occurs only when motivation, ability to act, and the trigger converge at the same moment. Factors such as personalization influence the user's motivation, while timing and user control reflect their impact on the ability to act in everyday life. These interrelated factors are summarized in Table 1 below.

| **Quality Factor** | **Description** | **Literature** |
|---|---|---|
| Personalization & Customization | Tailoring content and engagement strategies to individual user profiles is crucial for long-term retention and satisfaction. | Bidargaddi et al., 2018; Kim et al., 2026; Muench & Baumel, 2017; Mumcu & Çebi, 2025; Oakley-Girvan et al., 2021; V N & Sasikumar, 2025 |
| Content Relevance and Quality | The content must offer tangible value, be varied, and not be | Freyne et al., 2017; Gavilan & Martinez-Navarro, 2022; Poromatikul et al., 2019; Tan et |

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| | misleading in order to foster customer retention. | al., 2016; V N & Sasikumar, 2025; Viderisa et al., 2019; Wohllebe et al., 2021 |
| Frequency | Strategic management of delivery frequency, while a regular presence sustains user attention, excessive intensity leads to fatigue, reactance, and declining user acceptance. | Fahlman et al., 2018; Gavilan & Martinez-Navarro, 2022; Morrison et al., 2017; Pham et al., 2016; Wohllebe et al., 2021 |
| Timing & Context | Notifications should be delivered within "windows of opportunity" that do not disrupt the user's daily rhythm (non-interruption). Triggers should be aligned with the user's activities and context rather than relying on fixed points in time. | Avraham Bahir et al., 2019; Gavilan & Martinez-Navarro, 2022; Li, 2025; Muench & Baumel, 2017; Mumcu & Çebi, 2025; Pham et al., 2016; Poromatikul et al., 2019 |
| User control (Self-Regulation) | Users should have the autonomy to define the frequency, timing, and type of notifications themselves, based on their personal goals. | Bidargaddi et al., 2018; Muench & Baumel, 2017; Vaghefi & Tulu, 2019 |

Table 1: Quality Factors for the Design of Push Notifications in Personal Growth Apps

## Methodology

The aim of this study is to analyze the role of push notifications as a tool for user engagement in mHealth applications. A qualitative, comparative case study design is chosen to answer the research questions. This methodological approach allows for an examination of communication logics as well as the identification of specific patterns in app communication. The systematic comparison of providers forms the basis for a well-founded comparison and interpretation of user retention strategies.

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## Research Design

The choice of a case study as a research design depends on various criteria (Yin, 2009). According to Yin, the choice of the appropriate method depends on three conditions. Figure 1 illustrates these conditions and provides a framework for deciding on the methodological approach.

| METHOD | (1) Form of Research Question | (2) Requires Control of Behavioral Events? | (3) Focuses on Contemporary Events? |
|---|---|---|---|
| Experiment | how, why? | yes | yes |
| Survey | who, what, where, how many, how much? | no | yes |
| Archival Analysis | who, what, where, how many, how much? | no | yes/no |
| History | how, why? | no | no |
| Case Study | how, why? | no | yes |

Figure *1*: Choice of method (Source: Yin, 2009)

First, the research question addressed in this study requires a deep understanding of communication logics and thus falls under the “how” and “why” categories. Research questions of this nature are particularly well-suited to a case study design. The second criterion concerns the control of behavioral events. The study is conducted in a real-world user context where no experimental manipulation of variables is possible. Therefore, the experimental approach is not applicable. The third criterion relates to the temporal focus. The present study deals with current and dynamic communication processes rather than historically concluded events, which precludes the use of historical analytical methods.

Based on these three criteria, according to Yin (2009) the comparative case study design is the most appropriate methodological approach for this study, as it is the only one that meets all three criteria. The case study research design provides the framework within which the impact of push notifications is systematically assessed. The methodological approach is based on the structured, deductive qualitative content analysis described by Mayring and Fenzl (2019). This method allows for a “strictly rule-based” approach to conduct a systematic analysis. The research design consists of three phases:

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1. **Theoretical Framework:** Deductive derivation of analytical categories based on the theoretical framework.
2. **Systematic Data Collection:** Conducting a self-assessment of app usage over a defined period of time.
3. **Structured Analysis:** Applying the category system to conduct a systematic evaluation.

### Data Collection

Data was collected through systematic personal use of the two apps, “Headspace” and “7Mind,” over a period of 6 weeks. All incoming push notifications were fully documented, including the time, day of the week, and message text. To ensure the most comparable data set possible, the apps were used under identical conditions, meaning with notifications enabled, without any prior preference adjustments, and with comparable usage intensity. Technical recording was performed using screenshots, which were transferred into a data matrix in Excel. This approach ensures that the push notifications can be analyzed in their context of use and guarantees rule-based data collection according to Mayring and Fenzl (2019) which subsequently enables systematic coding of the material.

Following Mayring and Fenzl (2019) three units of analysis are defined for the study: the coding unit, the context unit, and the evaluation unit. The coding unit is the individual push notification, which serves as the smallest unit to be evaluated. This allows each text content to be assigned to the factors defined in Table 1, such as tone, frequency, personalization, etc. The context unit comprises the information that may be consulted for coding decisions in order to interpret them meaningfully. This includes the time of receipt (time of day or day of the week) as well as previous notifications. This prevents an isolated analysis and ensures that the intention behind a message is accurately analyzed. Finally, the evaluation unit covers the entire survey period for each app.

## Case Study

Since there are no primary scientific sources in the form of studies available for the apps examined, the descriptions of the respective apps are based on the providers’ official company websites. These websites serve as the most reliable source of information.

### Introduction to the Apps

#### Headspace

Headspace is an internationally oriented meditation and mindfulness app that specializes in structured, course-based learning. The app offers a variety of programs across four main categories, which are

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Meditation, Sleep, Movement, and Focus, and aims to help users initiate their mindfulness practice and seamlessly integrate it into their daily lives.

Headspace is used in over 200 countries around the world and, according to the company, has reached and positively impacted over 100 million people (Headspace, 2026). The app includes 1,000 guided meditations and courses designed to improve mental health. Studies conducted specifically for this purpose show that after 30 days, users experience 32% less stress and see an increase in productivity (Champion et al., 2018). Considering the definition of mHealth provided in Section 2.1, Headspace thus serves as a classic example of a wellness app that focuses primarily on prevention and lifestyle management. By utilizing mobile devices, it provides direct access to health services and promotes mental well-being.

### 7Mind

7Mind is a German-language app focused on mindfulness and mental health. The app offers short meditation sessions suitable for daily use, as well as programs for stress reduction, sleep, and emotional resilience, with an emphasis on incorporating just a few minutes into the user's daily routine. 7Mind's target audience primarily consists of German-speaking users seeking an accessible introduction to mindfulness practices. In total, there are over 2,000 audio guides designed to support users during difficult moments, helping them "recharge their batteries" and live more mindfully (7Mind, 2026). As a tool for promoting personal growth and psychological well-being, 7Mind uses the smartphone to deliver daily interventions that support an individual's development process. Notably, 7Mind's prevention courses are recognized by German statutory health insurance providers, with the costs covered up to 100% which underlines its clinical credibility.

## Case Selection Criteria

The selection of case studies from Headspace and 7Mind is based on a theory-driven and deliberate process. According to Yin (2018) the selection of study units is based not on sampling logic but on replication logic. It must demonstrate either similar results (literal replication) or different results that are nevertheless theoretically plausible (theoretical replication). Case selection is guided by three established criteria:

1. **Market positioning and comparability:** Headspace and 7Mind are among the most widely used meditation and mindfulness apps, but they differ significantly in terms of their market reach. Headspace is an English-language app and the global market leader, while 7Mind serves the German-speaking market and is one of the leading apps there. Yin (2018) emphasizes that cases in a multiple-case design are selected to reflect theoretically relevant contrasts or parallels. Due to the significant difference in market positioning, the case selection in this study

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follows the “theoretical replication” approach. It is precisely this difference in brand awareness and reach that makes the comparison particularly insightful and raises the question of whether and to what extent the strategies for using push notifications differ between a global and a regional provider.

2. **Consistency of the service offering:** Both apps offer a largely comparable range of features, including guided meditation, breathing exercises, and sleep-related content. Both use a subscription model. This structural similarity is methodologically significant in that it ensures that any observed differences can be attributed to strategic decisions rather than to differences in the products themselves. Yin (2018) emphasizes that even when case studies are contrasting, the core offerings of the apps under review must be similar to be comparable at all. The homogeneity of the selected apps, Headspace and 7Mind, meets this requirement and thus provides a basis for comparison.
3. **Relevance to mHealth research:** Headspace and 7Mind are two of the best-known players in the growing mHealth market. Their broad user base and commercial relevance make them suitable subjects for analyzing the use of push notifications in the context of digital services. Based on the “common case” criterion according to Yin (2018), widely used and everyday applications are particularly well-suited as case studies for deriving theoretically relevant findings. This makes the two apps relevant to practical applications for scientific research.

Based on these three criteria, the selected apps prove to be suitable and methodologically sound case studies for the present study.

# Results

The following chapter compares the results of regular use of Headspace and 7Mind over a 6-week period.

## Descriptive Analysis

Before coding based on the category system, a descriptive analysis of the collected data is conducted. The systematic data collection period spanned a total of 6 weeks (March 25 to May 10, 2026). During this period, a total of N = 143 push notifications were recorded through user activity. In terms of frequency and transmission times, both applications exhibit a standardized communication pattern. The 7Mind app follows a strict schedule. On each study day, exactly one notification was sent, which was self-selected and delivered at exactly 4:00 p.m. (n = 49). In contrast, Headspace uses a frequency of two notifications per day. Delivery times range from 9:04 a.m. to 9:10 a.m. in the morning and at a self-selected time of 3:00 p.m.

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Regarding the settings selected prior to data collection, Headspace allows users to activate mindful moments, recommendations, and meditation reminders. In practice, however, only mindful moments and meditation reminders were received during the observation period, while no recommendations occurred. 7Mind enables users to activate meditation reminders, new content, and promotional offers. During the observed period, users received meditation reminders and two promotional offers, but no notifications regarding new content.

In terms of formal text structure, the Headspace dataset exhibits a multilingual structure. The morning push notifications are sent in English, while the afternoon messages are written in German. 7Mind, on the other hand, communicates exclusively in German. One similarity between Headspace and 7Mind is the high degree of repetition in their reminder messages. Both providers send the exact same messages every day throughout the entire study period, whereas Headspace's morning messages vary in content from day to day.

## Systematic Analysis

After the data has been formally recorded, it is systematically structured in accordance with the workflow model of Mayring & Fenzl (2019) using a category system. Each documented push notification was assigned to the quality factors listed in Table 1. To ensure that this assignment process is transparent and reproducible, the factors were translated into clear coding rules based on visible text features. This results in the following structuring matrix for the company Headspace (Table 2):

| **Quality Factor** | **Empirical Findings** | **Anchor Example** | **Operationalized Coding Rule** |
|---|---|---|---|
| **Personalization & Customization** | Hybrid strategy: 47 (50%) personalized messages and 47 (50%) non-personalized messages, with N = 94. | "Tim, you deserve a break: Treat yourself to a short meditation." | Checking the text for the targeted integration of profile-based data, such as the first name. |
| **Content Relevance & Quality** | Headspace offers variety with fresh quotes every morning and doesn't use push notifications that are designed to be clickbait and misleading. | "Mindful Moment: Mediation can't make difficult situations go away. But it can shift how we relate to them" | Check for originality and text variation, as well as screening for manipulative clickbait (misleading content). |

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| **Frequency** | Standardized sending of two push notifications per day. One in the morning and one in the afternoon. | "Mindful Moment: Life only exists in the here and now. "<br>"Tim, you deserve a break: Treat yourself to a short meditation." | Measuring the frequency of push notifications sent within a day. |
| **Timing & Context** | Structured delivery of two push notifications per day. The first message is sent in the morning (around 9:05 a.m.) to help users start their day, while the second is sent at a time in the afternoon (3:00 p.m.) that has been preconfigured by the user. | "Mindful Moments: May your mind be like the sun, bright, open, and warm." (9:00 a.m.)<br>"Tim, you deserve a break: Treat yourself to a short meditation." (3:00 p.m.). | Chronological classification of timestamps to determine whether push notifications follow a regular distribution pattern and exhibit consistent daily rhythms. |
| **User Control (Self-Regulation)** | The system ensures precise control by offering customizable settings. Users can manually set the time for push notifications to be sent and configure other settings, such as "Mindful Moments." | "Mindful Moment: Forgiveness and compassion are the least discussed benefits of meditation."<br>"Tim, you deserve a break: Treat yourself to a short meditation." | Check the system for the presence of settings related to the frequency and timing of the user's push notifications. |

Table 2: Structure Matrix Headspace

The methodology was then applied to the company 7Mind, and a structural matrix was created (Table 3).

| **Quality Factor** | **Empirical Findings** | **Anchor Example** | **Operationalized Coding Rule** |
|---|---|---|---|
| **Personalization & Customization** | Complete absence of personalization or customization throughout the regular data collection | "What do you need today? Some peace and quiet, emotional support, or space to | Checking the text for the targeted integration of profile- |

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| | | | |
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| | period. The dataset records only two campaign-related anomalies featuring a name-based address coupled with a commercial product offer. | gather your thoughts? Take a moment now to recharge!" | based data, such as the first name. |
| **Content Relevance & Quality** | There is no variation, as all push notifications are identical throughout the entire survey period. 7Mind does not use "clickbait" to mislead users. | "What do you need today? Some peace and quiet, emotional support, or space to gather your thoughts? Take a moment now to recharge!" | Check for originality and text variation, as well as screening for manipulative clickbait (misleading content). |
| **Frequency** | Consistent frequency. A steady rate of exactly one push notification per calendar day. During the survey period, two anomalies occurred, which were caused by a promotional offer. | "…Take a moment now to recharge!"<br>"-30% off or not, Tim: Meditate your way to a discount on 7Mind" | Measuring the frequency of push notifications sent within a day. |
| **Timing & Context** | The timing is the same. The only push notification of the day is sent at a time a user-selected time. In this case study, it is sent at 4:00 p.m. However, two anomalies occurred during the observation period when notifications were delivered outside of this user selected timeframe. | "What do you need today? Some peace and quiet, emotional support, or space to gather your thoughts? Take a moment now to recharge!" | Chronological classification of timestamps to determine whether push notifications follow a regular distribution pattern and exhibit consistent daily rhythms. |
| **User Control (Self-Regulation)** | The system ensures targeted control by providing customizable settings. Users | "What do you need today? Some peace and quiet, emotional | Check the system for the presence of settings related to the |

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| | | | |
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| | have the option to disable notifications and can also choose when they are sent. | support, or space to gather your thoughts? Take a moment now to recharge!" | frequency and timing of the user's push notifications. |

Table 3: Structure Matrix 7Mind

In summary, Table 2 and Table 3 highlight fundamental differences in the communication logic between the two applications. While Headspace focuses on a hybrid approach combining text variation and personalization, 7Mind increasingly emphasizes regular frequency and a standardized approach. User autonomy and configuration options, however, are similar for both providers.

## Discussion

The results of the comparative case study show that both applications implement the quality factors identified in the literature to varying degrees. The comparison does not reveal a consistently superior strategy, but rather two contrasting communication logics, each with its own strengths and weaknesses. Both providers primarily use push notifications as a static communication instrument, whereas the literature calls for an adaptive, context-sensitive, and user-individual approach. This theory-practice gap runs systematically through nearly all examined factors and constitutes the central finding of this study.

### Personalization & Customization

The most pronounced difference between the two providers can be observed in the area of personalization. Headspace pursues a hybrid strategy, with 50% of its notifications containing personalized elements in the form of addressing the user by name. In contrast, 7Mind almost entirely refrains from any form of individualization. Only in two instances did 7Mind incorporate the user's first name into a push notification, both of which were used to promote its own premium model.

The literature emphasizes that the targeted alignment of content with the individual user profile is decisive for long-term retention and satisfaction (Bidargaddi et al., 2018; Muench & Baumel, 2017). This observation is consistent with the findings of Woodward et al. (2021), who demonstrate that only 32.6% of the analyzed mHealth app notifications contain any tailoring elements at all.

However, it must be critically noted that personalization in Headspace is limited to the insertion of the user's first name. The literature understands personalization as considerably more than addressing the user by name, namely the alignment of content and interaction strategies with the individual user profile, behavior, and personal goals (Bidargaddi et al., 2018; Muench & Baumel, 2017). Headspace fulfills the requirement only formally, not substantively. A further inconsistency concerns Headspace's language strategy: while reminder notifications are delivered in German, Mindful Moments are sent exclusively in

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English, despite the user's German language settings. This inconsistency represents a further missed opportunity for meaningful personalization. These observations suggest that Headspace's notifications are not effectively tailored to individual users.

For personal growth apps, whose core value proposition lies in the individual development of the user, this finding appears particularly relevant. 7Mind's largely absent personalization, which is limited to occasional promotional messages, appears to be at odds with the app's central value proposition, while even Headspace's name-only personalization does not fully exploit the available possibilities.

## Content Relevance & Quality

A similar pattern emerges with regard to content variation. Headspace delivers new, content-varying morning notifications each day in the form of "Mindful Moments", whereas 7Mind, with the exception of two anomalies, repeats an identical message throughout the entire six-week observation period. The literature explicitly demands that notification content must vary in order to foster app loyalty and prevent habituation. (Gavilan & Martinez-Navarro, 2022; Wohllebe et al., 2021).

The consistently identical messages used by 7Mind may pose a risk to long-term user retention. While "push fatigue" is classically attributed to a high sending frequency (Aliakbari et al., 2026; Khanday et al., 2025), it can be assumed that a lack of content variation may also foster an analogous habituation effect. Whether this effect actually occurs cannot be conclusively established on the basis of the available data. On a positive note, both providers refrain from misleading or manipulative content, thereby ensuring the integrity of their communication.

## Frequency

Headspace typically sends two notifications a day, while 7Mind sends one. Current research suggests that excessive frequency is the main cause of reactance and declining user acceptance (Morrison et al., 2017; Pham et al., 2016), but it is not possible to make a general statement about the optimal frequency. Wohllebe (2023) shows that the tolerated frequency is less a matter of an optimal level than of the maximum level perceived by the individual. This depends on user preferences, content relevance, and the app context (Bidargaddi et al., 2018). For mindfulness and personal growth apps, in which intrinsic motivation is considered a central driver of long-term use, 7Mind's less frequent notifications could potentially generate less reactance over time. The solution, therefore, does not lie in a uniformly set frequency, but in giving users the option to determine it for themselves (Bidargaddi et al., 2018; Muench & Baumel, 2017; Vaghefi & Tulu, 2019; Wohllebe, 2023). This approach is generally enabled by both providers through their configuration options and will be discussed in more detail in the context of user control.

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## Timing & Context

Both applications use fixed points in time for the delivery of their notifications. Headspace sends notifications in the morning between 09:04 and 09:10 a.m. as well as at 03:00 p.m., while 7Mind sends one daily at 04:00 p.m. Since most of these times were configured by the users themselves, this approach partially addresses the literature's call for context-sensitive delivery, as users can align notifications with their own daily rhythm. Exceptions can be observed in two promotional notifications within the 7Mind dataset. These anomalies consist of two distinct offers providing discounts of 30% and 40% on the full version of the application. Nevertheless, this approach is, on the whole, merely a static form of context adaptation. Once a time is set, it will likely remain unchanged, regardless of the actual situation, the user's mood, or their availability. In terms of the Fogg Behavior Model (Fogg, 2009), a time-based trigger is only effective if the user is actually motivated and able to act at the moment of receipt. Neither provider-defined nor user-defined fixed times can guarantee this, as both approaches lack the dynamic, sensor- or behavior-based triggering envisioned in the literature (Muench & Baumel, 2017; Woodward et al., 2021).

## User Control (Self-Regulation)

With regard to this quality factor, both providers show a comparable implementation. Both Headspace and 7Mind offer users the option to individually adjust delivery times and to deactivate notifications. This is in line with the recommendations of the literature, according to which user autonomy increases both the acceptance of push notifications and the overall use of an app (Bidargaddi et al., 2018; Vaghefi & Tulu, 2019). However, neither provider allows users to configure the sending frequency itself. Beyond timing, both apps offer category-based configuration options, although the descriptive analysis shows that not all activated notification types were actually delivered during the observation period, which limits the practical effectiveness of these settings. A comprehensive form of self-regulation covering frequency, timing, and type of notifications (Muench & Baumel, 2017; Vaghefi & Tulu, 2019) is therefore only partially implemented by both providers. The absence of a configurable frequency is somewhat less critical in this specific context, as both apps already operate at a comparatively low sending rate, although this does not exclude that some users might wish to increase the frequency. More relevant is the observation that the category-based settings do not consistently translate into the notifications actually received. Both providers therefore fulfill this factor in principle but fall short of the theoretical standard in its practical implementation.

Overall, the findings highlight a systematic gap between theoretical recommendations and practical implementation.

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### Limitations

The study has several limitations. First, the authors' own use of the apps may have influenced their usage behavior and, consequently, the notifications they received, as apps may adapt their notification strategies, for example, based on user engagement. Furthermore, the survey is based exclusively on the free versions of both apps, meaning that differing notification strategies for premium users were not captured. Third, the survey was conducted exclusively on iOS, which is why platform-specific differences in notification delivery on Android devices could not be taken into account. Fourth, the six-week survey period does not reflect long-term changes or seasonal fluctuations. Additionally, the study analyzes push notifications exclusively from the sender's perspective. Whether the observations actually lead to better or worse user retention cannot be proven without a user survey or experimental design. Furthermore, the data was coded by the authors themselves, so that despite operationalized coding rules, a certain degree of interpretive leeway remains. As a qualitative case study with two units of analysis, the results are also not generalizable.

## Conclusion

This study examined how push notifications should be used to foster user retention in personal growth apps and how this is actually implemented in practice, using Headspace and 7Mind as examples.

Regarding the first research question, five key quality factors were derived from the literature, which, in line with the Fogg Behavior Model, aim to design push notifications as effective triggers: Push notifications for personal growth apps should be personalized, vary in content, be sent at a frequency tolerable to the individual user, be context-dependent, and be configurable by the user via self-control functions.

With regard to the second research question, the six-week comparative case study showed that both providers only partially meet these theoretical requirements. Headspace implements the quality factors more consistently but often remains at a formal level. 7Mind exhibits significant shortcomings in personalization and content variety, which are only partially offset by a more conservative frequency strategy. The central common shortcoming lies in the time-based rather than context-based triggering of push notifications.

Future studies should incorporate the user perspective through surveys or experimental designs to determine whether the identified shortcomings actually result in measurable decreases in engagement or user retention. In addition, the sample size should be expanded, and the potential of context-aware trigger mechanisms should be examined in particular. In practice, it is important to note that push notifications should be understood less as mass communication and more as individually tailored triggers that are effective only when they align with the user's motivation, ability to act, and context.

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