

Examining sexual motivation profiles and their correlates using latent profile analysis

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Funding: The first author was supported by the ÚNKP-17-3 New National Excellence Program of the Ministry of Human Capacities. The first, the third, and the fifth authors were supported by the Hungarian Research Fund (NKFIH FK 124225). The preparation of this manuscript was also facilitated by a traveling grant awarded to the first author.

Conflict of interest: The authors declare no conflict of interest.

This document is a pre-publication version of the following manuscript:

Tóth-Király, I., Vallerand, R. J., Bőthe, B., Rigó, A., & Orosz, G. (2019). Examining sexual motivation profiles and their correlates using latent profile analysis. *Personality and Individual Differences, 146*, 76-86. doi: 10.1016/j.paid.2019.04.002

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Examining sexual motivation profiles and their correlates using latent profile analysis**Abstract**

According to self-determination theory, sexual motivations are cardinal in relation to sexual well-being and functioning. Despite that motivations are thought to occur in combination instead of separately, this proposition has not been explicitly tested in relation to sexual motivations. To address this issue, the present two-study investigation examined the simultaneous cooccurrence of multiple sexual motivations on distinct samples of young adults ($N_1 = 679$, $N_2 = 632$) using the novel latent profile analysis. To document the validity of the profiles and the positive and negative aspects of sexuality, theoretically-relevant correlates were also included from inside (sexual passion, sexual satisfaction, positive and negative emotions during sex) and outside (problematic pornography use and life satisfaction) the realm of partnered sexuality. Four highly similar profiles were identified across the two studies: (1) highly self-determined, (2) moderately self-determined, (3) moderately non-self-determined, and (4) highly non-self-determined. These profiles differed from one another on most, but not all, correlates with the more self-determined profiles being associated with more positive correlates. These results contribute to a better understanding of one's underlying sexual motivations by highlighting the importance of simultaneously considering these motivations in regard to sexual well-being.

Keywords: Dualistic model of passion (DMP); Latent profile analysis (LPA); Problematic pornography use; Self-determination theory (SDT); Self-determined motivation; Sexual motivation; Sexual passion

Sexuality is thought to be an important and integral part of human life (Satcher, 2001). Having sexual activities has been associated with better physiological and psychological health and well-being (Brody, 2010; Drory, 2002; Levin, 2007; Lindau & Gavrilova, 2010; Persson, 1981). However, despite sexuality having a central importance in life, the psychological study of sexuality mostly focuses on pathologies and the negative characteristics of sex such as hypersexuality and other problematic sexual behaviors (e.g., Bóthe, Bartók, et al., 2018; Bóthe et al., 2019; Grubbs, Perry, Wilt, & Reid, 2018), sexual risks (Kalichman, Simbayi, Kaufman, Cain, & Jooste, 2007), diseases (Chen, Gong, Liang, & Zhang, 2000), or other problems (Russell, 2005). While these studies certainly have importance, they paint a rather one-sided picture of human sexuality. This was reinforced by the call of Diamond and Huebner (2012) urging sexual research to investigate the various mechanisms through which sexuality influences well-being and health.

In line with prior studies (e.g., Gravel, Pelletier, & Reissing, 2016; Hill & Preston, 1996; Impett, Peplau, & Gable, 2005; Ingledew & Ferguson, 2007; Leigh, 1989; Meston & Buss, 2007), we posit that motivations and understanding why one engages in sexual relationships is of crucial relevance as these factors could differentiate between positive and negative sex-related correlates and highlight why some sexual experiences might not be satisfying. The present two-study investigation relied on self-determination theory (SDT; Ryan & Deci, 2017) which provides a well-articulated conceptualization of sexual motivations (i.e., why one has sex). Another important point is that one might endorse more than one sexual motivation whose simultaneous occurrence needs to be accounted for given their complex interactive nature. For this reason, across two distinct adult samples, we relied on the person-centered approach of latent profile analysis (LPA) which is able to reveal how different configurations of sexual motivations are organized within individuals. In addition, to better document the meaningfulness of the sexual motivation profiles and to better understand the positive and negative aspects of sexuality from the perspective of these motivational profiles, we also examined how profile membership predicted theoretically-relevant correlates inside and outside the realm of partnered sexuality.

The Perspective of Self-Determination Theory on Sexual Motivations

Research on motivations (i.e., why people engage in sexual activities) within the framework of SDT posit that sexual behavior is driven by different forms of motivations that one aims to satisfy. These motivations could differ based on the extent to which they are perceived as self-determined or autonomous (i.e., self-governing and in line with one's self-endorsed values; Deci & Ryan, 1985, 2000; Gravel et al., 2016). *Intrinsic motivation* (IMOT) is the most autonomous motivational form and implies that one engages in sex for its own sake (i.e., it is pleasurable and provides enjoyment). *Extrinsic motivation* is present when sex is performed for instrumental reasons, not for its own sake. Four types of extrinsic motivation have been identified along the self-determination continuum (Ryan & Deci, 2017), ranging from the most autonomous to the more controlled ones. In the case of *integrated regulation* (INTE), sex is fully internalized integral part of one's identity and it is a meaningful part of one's life (i.e., sexuality is thought to be an important aspect of life). *Identified regulation* (IDEN) manifests when sex is still significant, but not fully integrated part of one's identity; however, this activity is still performed, because it is perceived as part of the normal and healthy life (i.e., important to have new sexual experiences). With *introjected regulation* (INTR), having sex stems from internal pressures (i.e., engaging in sex to reduce anxiety or enhancing self-esteem). The least autonomous form is *external regulation* (EXTE) and is generated by external rewards or punishment (i.e., having sex to avoid conflict with the partner). Finally, *amotivation* (AMOT) refers to the lack of motivation and thus describes the absence of intention.

Apart from differentiating various motivations on the basis of self-determination, another important tenet of SDT is that these qualitatively different motivations have different consequences. In other areas of life such as work, sport, or education, self-determined motivations (i.e., intrinsic,

identified and integrated) have been associated with positive correlates such as job satisfaction and organizational commitment (Gagné & Deci, 2005), persistence in physical activity (Sarrazin, Vallerand, Guillet, Pelletier, & Cury, 2002), higher vitality during sports (Pelletier, Rocchi, Guertin, Hébert, & Sarrazin, 2017), less academic dropout (Vallerand, Fortier, & Guay, 1997), and better academic performance (Deci, Vallerand, Pelletier, & Ryan, 1991). At the same time, opposing results have been reported in relation to non-self-determined motivations (i.e., introjected, external, or amotivation; see also Ryan & Deci, 2017 for more details). Compared to these fields, relatively little research has been conducted with respect to sexuality. Still, autonomous sexual motivations have reportedly been associated with higher self-reported sexual functioning (Gravel et al., 2016), higher frequency of sex (Wood, Desmarais, Burleigh, & Milhausen, 2018), while controlled sexual motivations have been associated with lower self-esteem and anxiety (Vrangelova, 2015) as well as lower need fulfillment and relationship satisfaction (Wood et al., 2018).

All previous sexual motivation studies used variable-centered approaches to examine how sexual motivations relate to various correlates. Despite their importance, variable-centered approaches have their own limitations. More specifically, this approach does not account for the fact that motivations are multidimensional by nature and that people may have multiple reasons at the same time for performing sexual activities. Moreover, one might find it highly problematic to interpret effects when multicollinearity is present as a result of the theoretical closeness of the motivational factors. While these issues can be circumvented by using simplified motivational representations at the cost of information loss (e.g., relative autonomy index; see Grolnick & Ryan, 1987 or Howard, Gagné, Morin, & Forest, 2018), person-centered approaches provide a natural alternative solution by examining the interaction between different motivational factors.

Motivational Profiles

Person-centered approaches provide a uniquely informative and holistic understanding of sexual motivations and complement variable-centered studies by investigating the interaction of the different motivational factors. Importantly, person-centered approaches rest on the assumption that respondents might come from different subpopulations characterized by different levels of motivations. The present investigation used the state-of-the-art latent profile analysis (LPA) to identify homogenous subgroups of participants that are qualitatively and quantitatively different from one another (Marsh, Lüdtke, Trautwein, & Morin, 2009; Morin & Wang, 2016). In particular, LPA is naturally suited to test how different sexual motivations combine among different profiles of participants and the relative consequences of membership into the extracted profiles.

To date, as far as the authors know, no person-centered studies have been conducted with respect to sexual motivations. Nonetheless, there are some studies that serve as foundations for the present investigation from the fields of education (Gillet, Morin, & Reeve, 2017; Hayenga & Corpus, 2010; Ratelle, Guay, Vallerand, Larose, & Sénécal, 2007; Vansteenkiste, Sierens, Soenens, Luyckx, & Lens, 2009), sport (Aelterman, Vansteenkiste, Soenens, & Haerens, 2016; Bechter, Dimmock, Howard, Whipp, & Jackson, 2018; Haerens, Kirk, Cardon, De Bourdeaudhuij, & Vansteenkiste, 2010; Wang, Morin, Ryan, & Liu, 2016), and work (Gillet, Fouquereau, Vallerand, Abraham, & Colombat, 2018; Howard, Gagné, Morin, & Van den Broeck, 2016; Moran, Diefendorff, Kim, & Liu, 2012; Van den Broeck, Lens, Witte, & Van Coillie, 2013). In these studies, given their diverse range of instruments and methodologies, multiple number of profiles have been identified, typically ranging from three to six. Two common “core” profile configurations have emerged in most studies with the first being an autonomous motivational profile (characterized by high scores on the more self-determined as well as low scores on the non-self-determined factors) and the second being a controlled motivational profile (characterized by higher scores on the non-self-determined factors and lower scores on the self-determined factors). Additional “peripheral” profiles have also been identified such as moderately autonomous and moderately controlled profiles, mixed motivational profiles, non-

motivated profiles (Aelterman et al., 2016; Bechter et al., 2018; Howard et al., 2016) and even profiles characterized by high levels on both autonomous and controlled motivations (Haerens et al., 2010; Ratelle et al., 2007; Vansteenkiste et al., 2009; Wang et al., 2016).

In line with prior indirect SDT-based results, three-to-six profiles were expected to be identified with one being autonomous and one controlled profile. We also expected some peripheral profiles to emerge, but given their high variety in previous studies, we did not formulate any a priori hypotheses as to which ones would emerge. To support the substantive interpretation and meaningfulness of the extracted profiles, it is not sufficient to only identify profiles, but LPA needs to be complemented with theoretically meaningful key profile correlates as well (Marsh et al., 2009; Morin, Morizot, Boudrias, & Madore, 2011).

Profile Correlates

Sexual passion. Although sexual passion has generally been conceptualized as being single-dimensional, recent research (Philippe, Vallerand, Bernard-Desrosiers, Guilbault, & Rajotte, 2017) rooted in the Dualistic Model of Passion (DMP; Vallerand, 2015; Vallerand et al., 2003) proposed the extension of this concept by identifying two distinct forms, namely harmonious (HSP) and obsessive sexual passion (OSP). The DMP (Vallerand, 2015; Vallerand et al., 2003) identifies passion as an inclination toward a specific activity that one loves and enjoys, values, incorporates into his/her identity, and spends a significant amount of time and energy with it. Such an activity can be sex (see Philippe et al., 2017).

An important proposition of this model is the co-existence of two types of passions that differ from one another based on the process of internalization that takes place during engaging in sex-related activities (Ryan & Deci, 2017). Harmonious sexual passion (HSP) emerges when sex is freely incorporated into one's identity without any contingencies attached to this particular activity, resulting in free and autonomous activity engagement. With HSP, sexual activity is performed the way the individual wants to do so which is not in conflict with other relevant aspects of one's life, leading to potentially adaptive outcomes (e.g., positive emotions or better relationship quality). On the other hand, with obsessive sexual passion (OSP), activity engagement is more controlled when sex-related values, norms, and behaviors are not completely self-endorsed and instead imposed on the individual as inter- or intra-personal contingencies. These contingencies are, in turn, likely to lead to OSP. Finally, although one loves sex, feeling pressured to engage in this activity can even result in potentially maladaptive outcomes such as intrusive sexual thoughts or sexual conflicts (Philippe et al., 2017).

We hypothesized that people engage in sexual activities over the course of their lives due to different reasons or motivations and that these motivations might be associated with sexual passion¹. A few studies (Lafrenière, Vallerand, Mageau, & Charest, 2014 cited by Vallerand, 2015; Vallerand et al., 2006) have been conducted that directly investigated the associations between the different motivations and harmonious and obsessive passion (HP and OP). These studies investigated whether autonomous and controlled personality orientations (which bear conceptual similarities with autonomous and controlled motivations, respectively) could be related to HP and OP. Based on their results, autonomous personality orientation was positively related to HP, whereas controlled

¹ While there are some conceptual similarities between passion and motives, a closer inspection reveals their unique characteristics (see Curran, Hill, Appleton, Vallerand, & Standage, 2015 or Vallerand, 2015). Passion entails that the activity is part of one's identity, whereas intrinsic motivation does not. For instance, one might be intrinsically motivated for an activity without valuing it or considering it to be part of one's identity. In a similar manner, while SDT suggests that intrinsic motivation is invariably associated with positive outcomes, the DMP suggests that engagement in enjoyable activities might lead to positive or negative outcomes depending on the type of passion for the activity. With respect to extrinsic motivation, the goal is to achieve a goal that is separate from the activity, whereas passion refers to engaging in an inherently enjoyable activity.

personality orientation was positively related to OP. Other studies from the domain of sports (Curran, Appleton, Hill, & Hall, 2011) and work (Houliort, Philippe, Vallerand, & Ménard, 2014) support these findings. A recent meta-analysis also reported that autonomous motivations were more strongly related to HP, while controlled motivations were more strongly related to OP in general (Curran et al., 2015). We expected similar relations in that belonging to more autonomous profiles would be related to higher levels of HSP and belonging to the more controlled profiles would be associated with higher levels of OSP.

Sexual satisfaction. Besides sexual passion, sexual satisfaction is one of the most cardinal aspects of sexual activities with the majority of people reportedly finding it important to have a happy sexual relationship within a successful marriage (Taylor, Funk, & Clark, 2007). But sexual satisfaction is not only related to more positive intimate relationships (McNulty, Wenner, & Fisher, 2016), it is also associated with higher psychological well-being (Davidson, Bell, LaChina, Holden, & Davis, 2009), making it particularly relevant for the present investigation. Some prior evidence is already available with Gravel et al. (2016) as well as Wood et al. (2018) reporting positive associations between autonomous personal and relational motivations and sexual satisfaction. Outside the scope of SDT-based motivations, sexual satisfaction has positively been associated with having sex for intrinsic reasons (e.g., love or commitment), but negatively with extrinsic reasons (e.g., improving self-esteem; Stephenson, Ahrold, & Meston, 2011). Similar associations have been reported between approach motivations (i.e., the pursuit of pleasurable experiences; Gable & Impett, 2012) and sexual satisfaction (Impett et al., 2005; Muise, Impett, & Desmarais, 2013).

The Present Investigation

Based on previous theoretical (Vallerand, 1997) and empirical works (e.g., Vansteenkiste et al., 2009), the presence of sexual motivations might be important with respect to sexual and psychological functioning. However, equally important is the co-occurrence of these motivations given that individuals might endorse multiple motivations at the same time which, in turn, might be conducive of different sexual experiences. Thus, for a more detailed understanding, the overarching goal of the present two-study investigation was to examine the simultaneous occurrence of different sexual motivations across two independent adult samples with LPA. On the basis of previous studies, we expected the common core fully autonomous and fully controlled sexual motivation profiles to emerge. At the same time, some uncommon peripheral profiles were also expected to emerge. We also considered how the likelihood of profile membership is associated with key correlates of sexual passion and sexual satisfaction. Should autonomous and controlled profiles emerge, based on previous studies, it was expected that members of the autonomous profiles would have higher levels of HSP and sexual satisfaction, while members of the controlled profiles would have higher levels of OSP and lower sexual satisfaction. Furthermore, in Study 1, other theoretically-relevant correlates were also included from inside sexuality. Study 2 built on this perspective by also including correlates outside the realm of partnered sexuality.

Study 1

This study sought to investigate the presence as well as the positive and negative correlates of sexual motivation profiles. To this end—apart from sexual passion and sexual satisfaction that were included in both Study 1 and 2—in Study 1, we also investigated how motivation profiles are related to other variables inside the realm of partnered sexuality. For this purpose, positive and negative emotions experienced during sex were selected given their theoretical relevance. That is, although people engage in sex for various reasons, they might have different experiences during this activity; some might experience positive emotions, while others might experience negative ones. Gravel, Reissing, and Pelletier (2018) have already reported that sexual well-being was positively associated with autonomous sexual motivations and negatively with controlled motivations. Other studies outside sexuality also corroborated these findings (e.g., Gagné, Ryan, & Bargmann, 2003; Weinstein & Ryan,

2010). On the basis of these findings, apart from the general expectations mentioned above in relation to passion and sexual satisfaction, we also expected the more autonomous motivational profiles, relative to the more controlled profiles, to be associated with higher levels of positive sexual emotions and lower levels of negative sexual emotions.

Methods

Ethical Considerations

Both studies were conducted in accordance with the Declaration of Helsinki and with the approval of the University Research Ethics Committee. In both studies, the questionnaires were filled out online with the recruitment of Study 1 taking place in March-April 2017 and the recruitment of Study 2 in June-July 2017. Participants were first informed about the general aim and the topic of the study. If they wished to participate, they had to check a box; otherwise, they were excluded.

Participants

Participants were 679 Hungarian adults (66.6% female), aged between 18 and 62 years ($M = 26.57$ years, $SD = 7.39$ years) recruited in online groups, forums, and mailing lists². These participants reported their highest level of education as primary (5.0%), secondary (61.0%), and higher (34.0%); their place of residence as the capital city (42.1%), county capitals (14.0%), cities (28.4%), and villages (15.5%); and their relationship status as single (29.2%) and in a relationship (70.8%). The majority of the participants (84.7%) had sex at least on a monthly in the 12 months prior to data gathering.

Measures

Translation procedures. All non-validated measures used in these studies were translated and back-translated based on the procedure of Beaton, Bombardier, Guillemin, and Ferraz (2000).

Sexual motivations. The 24-item Sex Motivations Scale (SexMS; Gravel et al., 2016) was used to assess six dimensions (four items each) of respondents' motivations toward sexual relationships: intrinsic motivation (e.g., "Because I enjoy sex"; $\alpha = .72$); integrated (e.g., "Because sexuality is a meaningful part of my life"; $\alpha = .90$); identified (e.g., "Because sexuality is a normal and important aspect of human development"; $\alpha = .73$); introjected (e.g., "To prove to myself that I am a good lover"; $\alpha = .90$); external (e.g., "To live up to my partner's expectations"; $\alpha = .78$); and amotivation (e.g., "I don't know; actually, I find it boring"; $\alpha = .84$). Participants were asked to rate items on a seven-point scale (1 = does not correspond at all; 7 = corresponds completely). The Hungarian version is available in Appendix 1 of the online supplements.

Sexual passion. The Passion Scale (Marsh et al., 2013; Tóth-Király, Bóthe, Rigó, & Orosz, 2017; Vallerand et al., 2003) assesses the level of passion one has for a certain activity on the basis of two dimensions: harmonious passion (six items; e.g., "My activity is in harmony with the other activities in my life"; $\alpha = .87$) and obsessive passion (six items; e.g., "I have almost an obsessive feeling for my activity"; $\alpha = .87$). In the present case, the word "activity" was replaced by the word "sex". Participants indicated their level of agreement on a seven-point scale (1 = not agree at all; 7 = very strongly agree).

Sexual satisfaction. A single item measure was used to assess respondents' sexual satisfaction (Overall, to what extent are you satisfied with your sexual life?) as it has been shown to be satisfactory compared to questionnaires measuring sexual satisfaction including multiple items (Mark, Herbenick, Fortenberry, Sanders, & Reece, 2014; Philippe et al., 2017). The item was rated on a five-point scale (1 = not satisfied at all; 5 = completely satisfied).

Positive and negative emotions. Adapted from Philippe et al. (2017), participants were rated the extent they experience positive (five items; e.g., enthusiastic, happy, in a good mood; $\alpha = .88$) and

² Examples of these are Pestén Hallottam [I heard in Budapest] or the student mailing list of the University of Szeged.

negative (five items; e.g., guilty, anxious, disgusted; $\alpha = .62$) emotions during sex. Items were rated on a five-point scale (1 = very slightly, or not at all; 5 = very much).

Statistical Analyses

All preliminary and main analyses were performed with Mplus 8 (Muthén & Muthén, 1998-2017) and were identical across the two studies.

Preliminary measurement models. Given that using latent variables in mixture models is computer-intensive and often results in convergence problems, the present investigation relied on factor scores (specified with a mean of 0 and a standard deviation of 1) saved from preliminary measurement models and used these factor scores as profile and correlate indicators. Following previous theoretical (Asparouhov & Muthén, 2009; Marsh, Morin, Parker, & Kaur, 2014) and empirical papers (e.g., Marsh et al., 2013; Tóth-Király, Orosz, et al., 2017), sexual motivation and passion were modeled via exploratory structural equation modeling (ESEM), while the remaining variables were modeled via confirmatory factor analysis (CFA). More information is provided in Appendix 2 of the online supplements.

Latent profile analysis (LPA). Subsequently, LPA—including one to eight profiles—was conducted with the robust maximum-likelihood estimator (MLR) to identify profiles of participants based on their sexual motivations. To avoid converging on suboptimal local maximum, all models were estimated with 5000 random start values, 1000 iterations, and the 200 best solutions were retained (Gillet, Morin, Cougot, & Gagné, 2017; Hipp & Bauer, 2006; Tóth-Király, Bőthe, Orosz, & Rigó, 2018). Means and variances of the profile indicators were freely estimated (Diallo, Morin, & Lu, 2016). Once the final solution was identified, the profiles were compared on the basis of the correlates using Mplus' (e) auxiliary function (Asparouhov & Muthén, 2007) which tests the equality of the means of the correlates across the profiles without assuming directionality between profile membership and the correlates³.

Results and Brief Discussion

Latent Profiles of Sexual Motivations

The optimal number of profiles was selected on the basis of various fit indices and of the comparison of alternative profile solutions (more details are provided in Appendix 3 of the online supplements). A four-profile solution was retained as a final solution and is displayed on Figure 1. Profile 1 (including 37.41% of the respondents) was labeled as *highly self-determined* profile following higher than average scores on IMOT, INTE, and IDEN, average scores on INTR, and lower than average scores on EXTE and AMOT. Profile 2 (including 29.16% of the respondents) was a *moderately self-determined* profile characterized by average levels of IMOT and lower than average levels on all other motivational factors. Profile 3 (with 21.94% of the respondents) was a *moderately non-self-determined* profile as apparent by the higher than average INTR and EXTE scores as well as the average scores on the other factors. Finally, Profile 4 (11.49% of the respondents) was a *highly non-self-determined* profile given the higher than average scores on EXTE and AMOT and the lower than average scores on INTR, INTE, and IDEN.

Correlates of Profile Membership

Correlates were added to the final 4-profile solution and revealed the differentiated effects of profile membership with some interesting findings (exact means and standard errors are reported in Table 1, graphically represented in Figure 2, while pairwise comparisons are reported in Table S11 of the online supplements). More specifically, levels of both harmonious and obsessive passion were highest in the highly self-determined profile, followed by the moderately non-self-determined, the moderately self-determined, and the highly non-self-determined profiles. Of additional importance are

³ Mplus syntax for the preliminary measurement models and the LPA models are also provided in the online supplementary document in case one wishes to conduct similar future studies.

positive and negative affect during sex which followed the expected patterns in that the more desirable levels were associated with more self-determined profiles relative to more non-self-determined ones. As for sexual satisfaction, respondents having highly non-self-determined motivation had the lowest sexual satisfaction compared to the other profiles, but the other profiles did not differ from one another⁴.

Overall, four sexual motivation profiles have been identified that are theoretically-relevant, demonstrating the importance of person-centered approaches in the case of complex constructs such as motivations. Profiles extracted in the present study also correspond to academic, work, and sport motivation profiles (e.g., Bechter et al., 2018; Gillet et al., 2018; Howard et al., 2016; Wang et al., 2016), giving further support for their validity. At the same time, membership to these profiles was differentially related to various sex-related correlates. Members of the highly self-determined profile reported the highest level of HSP, OSP, positive emotions during sex, while the highly non-self-determined profile was its reverse. Interestingly, members of the moderately non-self-determined profile reported higher levels of passion than members of the moderately self-determined profile.

Study 2

Despite the promising results of Study 1, the replicability of the findings should be further tested in order to minimize capitalizing on chance. Therefore, a second study was carried out with a different sample to assess the generalizability and replicability of our findings. At the same time, similar to Gravel et al. (2016), we wished to examine whether the effects of sexual motivations span beyond the domain of partnered sexuality. For this reason, apart from sexual passion and sexual satisfaction, more general correlates were considered that are outside the realm of partnered sexuality, namely life satisfaction and problematic pornography use with the latter being an individual-based sexual activity (Efrati & Mikulincer, 2018). Still, these variables were not only selected for convenience purposes.

Life satisfaction is one of the most common indicators of one's general well-being. Previous studies have already reported positive associations between more autonomous or self-determined motivations and various indicators of general psychological well-being, suggesting that performing sex for autonomous reasons is not only related to higher sexual satisfaction but higher life satisfaction as well (Brunell & Webster, 2013; Gravel et al., 2018). Therefore, life satisfaction was expected to operate similarly to sexual satisfaction in that more self-determined profiles would be associated with higher life satisfaction compared to more non-self-determined profiles.

There is a small body of literature on sexual motivations and pornography use. Trait sexual motivation (i.e., trait-like individual motivation to be sexually active) has been associated with problematic use of sexually explicit materials on the internet (Stark et al., 2017). Theoretical models have also been proposed that underlie the importance of pleasure seeking (i.e., akin to IMOT) and discomfort avoidance (i.e., akin to INTR) in problematic pornography use (Grubbs, Braden, Kraus, Wilt, & Wright, 2017). While problematic pornography use has not been examined in relation to SDT-based sexual motivations, SDT motivations in other fields had diverse associations with different problematic or risky behaviors in previous studies. More specifically, intrinsic academic motivation had a negative association with current and lifetime drinking behavior, while external regulation had positive association with current drinking behavior among university students (Wormington, Anderson, & Henderlong Corpus, 2011). In the case of online gaming (Király, Tóth, Urbán, Demetrovics, & Maraz, 2017; Yee, 2006), escapism, advancement, achievement and competition motivations (which might be interpreted as different forms of extrinsic motivation) had positive associations with internet gaming disorder. Regarding sexuality-related constructs, autonomous

⁴ Auxiliary analyses revealed that profile membership was not associated with either gender (coded as 0 = male and 1 = female) or relationship status (coded as 0 = single and 1 = in a relationship).

motivation was negatively related to risky sexual behaviors (i.e., number of casual sexual partners, unprotected sexual intercourse, unprotected sexual intercourse under the influence of alcohol or drugs, having pregnancy and sexually transmitted disease tests), while controlled motivation was unrelated to them (Ingledeu & Ferguson, 2007). The aforementioned results suggest that autonomous motivations may have a protective role in problematic and risky behaviors, while controlled motivations may result in risky or problematic behaviors. Thus, it was hypothesized that more self-determined profiles would be associated with lower levels of problematic pornography use compared to non-self-determined profiles.

Methods

Participants

Participants (all different from those used in Study 1) were 632 Hungarian adults (66.6% female), aged between 18 and 65 years ($M = 26.02$ years, $SD = 6.91$ years) recruited in online groups, forums, and mailing lists⁵. These participants reported their highest level of education as primary (9.3%), secondary (59.5%), and higher (31.2%); their place of residence as the capital city (44.6%), county capitals (13.9%), towns (27.4%), and villages (14.1%); and their relationship status as single (26%) or in a relationship (74%).

Measures

Sexual motivations. The same scale (Gravel et al., 2016) was used as in Study 1. Cronbach's alphas were similarly good as in Study 1, ranging from .75 (identified) to .91 (introjected).

Sexual passion. Similar to Study 1, the Passion Scale (Tóth-Király, Bóthe, et al., 2017; Vallerand et al., 2003) was used, referring to sex. Again, reliability was adequate for both harmonious ($\alpha = .81$) and obsessive ($\alpha = .85$) passion.

Sexual satisfaction. See Study 1.

Problematic pornography use. The six-item version of the Problematic Pornography Consumption Scale (PPCS; Bóthe, Tóth-Király, Zsila, et al., 2018) was used to assess problematic use along the six components model of Griffiths (2005), namely salience, tolerance, mood modification, withdrawal, relapse, and conflict (e.g., "I felt that I had to watch more and more porn for satisfaction"; $\alpha = .84$). Participants indicated their responses using a seven-point scale (1 = "never"; 7 = "all the time").

Satisfaction with life. The Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) is a five-item scale (e.g., "The conditions of my life are excellent"; $\alpha = .89$) assessing the general satisfaction with life on a 7-point Likert scale (1 = not true to me at all; 7 = absolutely true to me).

Results and Brief Discussion

Results pertaining to LPA were remarkably similar to those of Study 1 with a four-profile solution being selected as the most optimal one on the basis of fit indices and profiles comparisons. See Figure 3 for the graphical representation of the profiles. Once again, Profile 1 included *highly self-determined* respondents (35.44%) with increased autonomous motivations and decreased controlled motivations. Profile 2 included *moderately self-determined* respondents (27.22%) with average autonomous motivations and lower than average controlled motivations. Profile 3 included respondents (26.26%) with *moderately non-self-determined* motivations as apparent by the slightly elevated INTR and EXTE scores. Finally, Profile 4 consisted of respondents (11.08%) who had *highly non-self-determined* sexual motivations given their substantially elevated EXTE and AMOT scores and their substantially decreased scores on autonomous motivations⁶.

⁵ For instance, Youths of Kecskemét [a Hungarian city] or Kérdőív Pont [Questionnaire point].

⁶ Compared to Study 1, auxiliary analyses here revealed that being female was associated with lower likelihood of membership into the moderately non-self-determined profile compared to the highly self-determined (odds ratio [OR] = 0.415), the moderately self-determined (OR = 0.584), and the highly non-self-determined (OR =

Pairwise comparisons were conducted to examine whether the four profiles differed with respect to the correlates (exact means presented in Table 2 and graphically represented in Figure 4). Findings were similar to Study 1 in that harmonious and obsessive sexual passion was the highest in the highly self-determined profile, followed by the moderately non-self-determined, the moderately self-determined, and the highly non-self-determined profiles. Problematic pornography use was the lowest in moderately self-determined profile, followed by the highly self-determined, the moderately non-self-determined, and the highly non-self-determined profiles. Somewhat surprisingly, with regards to problematic pornography use, significant differences only pertained to the moderately self-determined profile in relation to the other profiles. Regarding sexual satisfaction and satisfaction with life, more desirable levels were once again associated with the more self-determined profiles compared to the more non-self-determined ones.

General Discussion

The present two-study investigation sought to provide a deeper understanding of the positive and negative aspects of sexuality by identifying profiles of sexual motivations using the person-centered LPA. This approach appeared to be suitable for the assessment of simultaneously present motivational factors that are thought to make up motivational profiles. Interestingly, despite SDT stating that motivations are likely to occur in some combinations (Ryan, Williams, Patrick, & Deci, 2009; Vallerand, 1997), this proposition has not been tested with respect to sexual motivations. The results, across two distinct studies, supported the extraction of four profiles which align well with the proposition of SDT, namely highly self-determined, moderately self-determined, moderately non-self-determined, and highly non-self-determined profiles. These profiles also differed from one another along a wide range of key correlates (i.e., sexual passion, sexual satisfaction, emotions during sex, problematic pornography use, and life satisfaction). Findings lead to a number of important theoretical and practical implications.

Sexual Motivation Profiles

The current research provides an incremental contribution to the literature with the identification of four sexual motivation profiles differing from one another not just in terms of quantity (i.e., overall amount of motivation), but quality (i.e., specific motivational features) as well: (1) highly self-determined profile, (2) moderately self-determined profile, (3) moderately self-determined profile, and (4) highly self-determined profile. These profiles correspond to the results of prior studies with respect to academic (e.g., Gillet et al., 2017; Wang et al., 2016) and work motivations (e.g., Howard et al., 2016). The first profile was characterized by high levels of IMOT, INTE, and IDEN (i.e., more self-determined motivations) as well as average levels of INTR and lower than average levels of EXTE and AMOT (i.e., more non-self-determined motivations). Although not measured, members of this profile might have a high sexual desire which might be associated with the high levels of autonomous motivations. As a result of this autonomous sexual integration, members of this profile might engage in sex because they find it enjoyable and personally important. Interestingly, the fourth profile is the mirror image of the first profile (i.e., high levels of non-self-determined motivations and low level of self-determined motivations). These profile members might not engage in sex fully volitionally (as apparent by the high levels of amotivation), but they might do so regardless for the sake of avoiding conflicts with others. It is reasonable to assume that members of these profiles may not have sexual desire, though this proposition should be tested in future studies. Both extracted profiles could be interpreted as representing an overall self-determination continuum (Ryan & Deci, 2017) as apparent by the increase and decrease in the level of regulations ranging from the more self-

0.443) profiles. In addition, being in a relationship was associated with lower likelihood of membership into the moderately self-determined profile compared to the moderately non-self-determined (OR = 0.535) and the highly non-self-determined (OR = 0.382) profiles.

determined to the more non-self-determined ones and both profiles appear to be core profiles as these have been identified in most prior studies (e.g., Haerens et al., 2010; Ratelle et al., 2007; Vansteenkiste et al., 2009).

Two other profiles were also identified with the first being a moderately self-determined profile characterized by average levels of IMOT and lower than average levels on the other motivational factors. Members of this profile are intrinsically motivated for sex on an average level and they might not engage in unwanted sexual behavior if they are not intrinsically motivated to do so (i.e., low non-self-determined motivations). The final profile was a moderately non-self-determined one characterized by higher than average levels of INTR and EXTE and average levels on all other factors. Members of this profile might engage in sex to meet either self- or other-related expectations, thus complying with internal or external demands. Profiles similar to the latter two have also been identified in some prior studies (e.g., Gustafsson, Carlin, Podlog, Stenling, & Lindwall, 2018; Howard et al., 2016), though these configurations appear to be less common. Together, the four profiles might also be interpreted as representing a transition between self-determined and non-self-determined sexual motivations. Overall, our results support prior studies (e.g., Howard et al., 2016) in highlighting the importance of relying on a complete range of behavioral regulations in the estimation of motivational profiles.

At the same time, it appears to be equally important to rely on adequate person-centered approaches that are able to provide a more fine-grained representation of sexual motivations. LPA provides such an approach and assumes that a sample is made up of a mixture of various subpopulations (instead of assuming that all respondents belong to the same group). Compared to cluster analysis, LPA also assumes that the variances of the profile indicators are not the same across profiles, that profile indicators are unrelated to one another conditional on the latent profiles, and that respondents have a probability of membership in all profiles instead of exclusively “forcing” them into one or the other. For more discussion on LPA, see Meyer and Morin (2016) or Morin (2016).

Correlates of Sexual Motivation Profiles

As suggested by Granvold (2001), having a passionate love life is an important aspect of life. The recent delineation of harmonious and obsessive sexual passion (HSP and OSP, respectively; Philippe et al., 2017) provided us with the opportunity to examine how different sexual motivation configurations are associated with HSP and OSP. It was expected that the more self-determined profiles would be associated with higher levels of HSP, while the more non-self-determined profiles would be associated with OSP. Strictly speaking, this was not the case in the present investigation. HSP and OSP had similar associations with profile membership: HSP and OSP were the highest in the highly self-determined profile, followed by the moderately non-self-determined profile, the moderately self-determined profile, and the highly non-self-determined profile.

This result may be explained by the elevated levels of intrinsic motivation. Compared to SDT which focuses on extrinsic elements, the DMP describes that intrinsically interesting elements can further be internalized into one's identity in an autonomous or controlled manner, leading to the development of HP or OP for an activity, respectively (Diefendorff, Houlihan, Vallerand, & Krantz, 2018). The observed high levels of intrinsic motivation might be driving this effect. Future studies are needed to better understand such an effect and the variables that might be important for the internalization process. The highly non-self-determined profile (Profile 4), given that it was a mirror opposite of Profile 1, had substantially low levels of IMOT, INTE, and IDEN. One might interpret this as members of this group not engaging in sex volitionally at all and it might equally be possible that they do not have a high desire for sex. For this reason, they reported the lowest levels of HSP and OSP.

The comparison of the two intermediate profiles reveals more nuanced differences. Members of the moderately self-determined profile (Profile 2) had average levels of IMOT, *but* slightly lower

than average levels of INTE and IDEN as well as lower than average INTR, EXTE, and AMOT. Thus, these individuals might find sex pleasurable, but they do not appear to fully endorse other reasons for sex as in the case of the other three profiles. These individuals thus might not become highly passionate for sex (neither harmoniously, nor obsessively), only moderately. Members of Profile 3 (moderately non-self-determined) also had average levels of IMOT, *and* they also reported average levels of INTE and IDEN. Endorsing all three autonomous factors, instead of just one, appears to be important from the perspective of passion: people might more likely be harmoniously passionate for sex if they engage in it because it is pleasurable, because it is integrated into their self and because it is personally significant. As for obsessive sexual passion, the elevated levels of INTR and EXTE might be attributed to the higher OSP levels which are in line with Vallerand et al. (2006) who reported that a controlled personality orientation (constructed from the external and introjected regulation subscales) was associated with OP. Predominantly endorsing controlled motivations might lead to suboptimal internalization and, as a consequence, OSP. The consistent ordering of the profiles (i.e., Profile 1, Profile 3, Profile 2, and Profile 4) give support for the validity of the passion-related results.

Sexual satisfaction was also identified as a theoretically-relevant correlate of profile membership. Although there are some minor between-sample differences with respect to the ordering of the profiles, results of Study 1 partially support the a priori expectations, while Study 2 fully supports them. Namely, endorsing self-determined forms of motivations was associated with higher levels of sexual satisfaction which is congruent with previous variable-centered findings (Gravel et al., 2016; Wood et al., 2018). The present investigation suggests that engaging in sex for more self-determined reasons (e.g., enjoyment and personal importance) might be related to higher levels of well-being within the activity. However, it has to be noted that the profiles failed to clearly discriminate differences in sexual satisfaction which might be attributed to its assessment. The present investigation only focused on a narrower understanding of sexual satisfaction which could have also biased our findings. Future studies should also incorporate, similar to Gravel et al. (2016), a wider understanding of sexual satisfaction that includes, for instance, satisfaction with frequency and types of sexual activities as well as with the functioning of one's body (Štulhofer, Buško, & Brouillard, 2010).

The two studies included other well-being correlates that were inside (Study 1) and outside (Study 2) the realm of partnered sexuality (i.e., positive-negative emotions during sex and life satisfaction, respectively). Results pertaining to these correlates align well with the general expectations; membership to the more self-determined profiles was associated with higher levels of positive emotions and life satisfaction as well as lower levels of negative emotions during sex. Endorsing a combination of self-determined sexual motivations (e.g., IMOT and INTE) appears to allow people to experience joy and positive emotions associated with the activity of sex and, at the same time, also experiencing positive emotions in life in general. On the other hand, when they endorse multiple controlled motives (or when they lack the intention for sex), people are more likely to experience negative emotions and have fewer positive emotions as well as lower life satisfaction, partly because they do not necessarily find this activity enjoyable and because they do not engage in sex completely volitionally.

Results appear to be more complex with respect to problematic pornography use as members of the moderately self-determined profile reported the lowest levels of problematic pornography use, while the other three profiles had equal levels to one another. Individuals in the highly non-self-determined profile reported the highest level of problematic pornography use. Individuals in this profile might experience being forced to engage in real-life sexual behaviors in which they do not necessarily want to, thus, they might feel losing their autonomy regarding their sexual behaviors. As pornography is easily accessible, affordable (or in the most cases free) and anonym, it might provide them a wide variety of pornographic materials, autonomous decision-making and a way to escape

from real-life experiences, which in turn, may result in the engagement of pornography use in a problematic manner (Cooper, 1998; Young, Griffin-Shelley, Cooper, O'mara, & Buchanan, 2000).

Individuals in the highly self-determined profile were expected to have the lowest level of problematic pornography use. However, individuals in the moderately self-determined profile reported the lowest level of problematic pornography use. These results might be explained by the fact that individuals in the highly self-determined profile might experience higher sexual drive or desire than individuals in the moderately self-determined profile, resulting in more frequent pornography use as a way to alleviate high sexual desire that might not necessarily be fulfilled in real-life. These results are in line with previous studies indicating that using pornography to experience sexual activities that may not be experienced in real-life situations may result in higher levels of problematic pornography use (Bóthe, Tóth-Király, Demetrovics, & Orosz, 2018). Future studies are needed to test these hypotheses.

Limitations, Future Research, and Practical Implications

The present investigation made some significant contributions to the scientific literature. This research examined different specific sexual motivations configurations instead of relying on more global, simplified dimensions by relying on the state-of-the-art LPA. This investigation showed the added value of a person-centered approach by identifying distinct subgroups of participants who have quantitatively and qualitatively different motivations, something which would not have been possible via variable-centered approaches. Another contribution of this approach is that it becomes visible that people endorse multiple motivations at the same time. The highly similar results across the two studies revealed a more nuanced picture about the relationship between sexual motivations and sexual passion as well as other profiles correlates.

However, there are also some limitations of the present investigation that need to be noted. First, the two studies employed a cross-sectional design that does not allow for causal inferences. An important next step in this research would be the application of experimental designs to examine the causal relations between sexual motivations in HSP and OSP. Additionally, longitudinal studies would also be essential to test the temporal stability of the profiles and to test the directionality between the examined constructs. Longitudinal studies would also be fruitful in examining within-person and between-person changes in sexual motivation profiles. Second, the studies were questionnaire-based which could lead to distorted results due to potential biases (e.g., social desirability). The results should be replicated with other, more comprehensive or even representative samples in order to have even more generalizable conclusions. LPA itself also has limitations that should be kept in mind. Absolute fit indicators (e.g., CFI or RMSEA) are not available for mixture models, only relative fit indicators (e.g., SSABIC or CAIC) which might make the class enumeration process difficult in case these relative indicators do not converge on the same solutions. Another limitation is that fully latent variables—which are completely corrected for measurement error—are difficult to include into mixture models. Although the present research relied on factor scores saved from fully latent measurement models that are partially corrected for measurement error, it still represents a limitation. While diverse correlates were included in the present investigation, other ones (e.g., sexual functioning and dysfunctioning, self-esteem, psychological distress, previous sexual experiences, sexual desire) could also be used in future studies to more fully grasp the potential differences between the different motivational profiles. It might also be important to identify potential profile predictors such as need satisfaction and need frustration (Tóth-Király, Morin, Bóthe, Orosz, & Rigó, 2018; Vansteenkiste & Ryan, 2013). As mentioned above, future studies should measure sexual satisfaction in more details. Finally, future research should also verify whether the present results generalize to other cultures that are different from the Hungarian one and to other life areas (e.g., academic motivations and academic passion or sport motivations and sport passion).

As for practical implications, from the perspective of problematic pornography use, belonging to the highly non-self-determined profile may be considered a risk factor of developing problematic

pornography use. Individuals being amotivated or externally motivated toward sexual activities might have a higher risk of engaging in pornography use in a problematic manner. If individuals do not feel like having partnered sex, pornography may provide them an easy, anonymous, and affordable way to satisfy their sexual needs, which in turn may lead to problematic pornography use (Young et al., 2000). Therefore, in targeted interventions, the reduction of amotivation and external motivation as well as the promotion of intrinsic, integrated, and identified motivations toward sex may help individuals to reduce their problematic pornography use. From the perspective of romantic relationships, having highly self-determined motivations toward sex may result in higher levels of sexual satisfaction, which in turn is strongly associated with relationship satisfaction (e.g., Bőthe, Tóth-Király, Demetrovics, & Orosz, 2017). Thus, when individuals attend couple therapy because of relationship problems, developing autonomous motivations toward sex may also improve their relationship. From the perspective of sexual education for adolescents, it would be useful to explain to them that people can have different motivations for having sex. Having sexual motivations are natural parts of human development and it is normal that they are interested in sexuality-related activities. However, it would be important to emphasize the potential positive effects of highly self-determined sex motivations (e.g., higher levels of sexual satisfaction and well-being) and the potential negative effects of external motivations or amotivation toward sexual activities (e.g., negative emotions during sex).

Conclusion

In sum, across two samples of young adults, four sexual motivation profiles were identified, representing a transition from the more self-determined to the more non-self-determined motivations. Furthermore, the present results showed that the endorsing multiple self-determined motivations was related to the highest levels on most desirable correlates (e.g., sexual passion, sexual satisfaction, life satisfaction, and positive emotions during sex), while endorsing several non-self-determined motivations was associated with non-desirable correlates (e.g., low passion as well as sexual and life satisfaction, negative emotions during sex). Differences between the two moderate profiles were more fine-grained. These results highlight the importance of taking the interplay of one's sexual motives into account for better understanding the positive and negative aspects of sexuality.

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Table 1*Means of correlates and pairwise comparisons between the four sex motivation profiles (Study 1)*

Correlates	1.	2.	3.	4.	Differences between profiles
	Highly self-determined	Moderately self-determined	Moderately non-self-determined	Highly non-self-determined	
	Mean (SE)	Mean (SE)	Mean (SE)	Mean (SE)	
Harmonious sexual passion	0.632 (0.042)	-0.277 (0.052)	-0.045 (0.061)	-1.294 (0.105)	4 < 2 < 3 < 1
Obsessive sexual passion	0.394 (0.063)	-0.298 (0.055)	0.128 (0.081)	-0.708 (0.073)	4 < 2 < 3 < 1
Sexual satisfaction	0.108 (0.067)	0.096 (0.073)	-0.060 (0.081)	-0.456 (0.112)	4 < 3 = 2 = 1
Positive emotions during sex	0.426 (0.038)	0.188 (0.046)	-0.269 (0.073)	-1.270 (0.154)	4 < 3 < 2 < 1
Negative emotions during sex	-0.216 (0.047)	-0.232 (0.035)	0.232 (0.066)	0.825 (0.165)	2 = 1 < 3 < 4

Note. SE: standard error.; As correlates were estimated from factor scores saved from preliminary measurement models with a mean of 0 and a standard deviation of 1, zero signifies that a correlate is on an average level. Scores substantially higher than zero are considered above average, while scores substantially lower than zero are considered below average.

Table 2*Means of correlates and pairwise comparisons between the four sex motivation profiles (Study 2)*

Correlates	1.	2.	3.	4.	Differences between profiles
	Highly self-determined	Moderately self-determined	Moderately non-self-determined	Highly non-self-determined	
	Mean (SE)	Mean (SE)	Mean (SE)	Mean (SE)	
Harmonious sexual passion	0.629 (0.047)	-0.339 (0.066)	-0.032 (0.059)	-1.047 (0.108)	4 < 2 < 3 < 1
Obsessive sexual passion	0.406 (0.065)	-0.356 (0.068)	0.021 (0.072)	-0.452 (0.106)	4 = 2 < 3 < 1
Sexual satisfaction	0.294 (0.067)	0.113 (0.075)	-0.215 (0.079)	-0.647 (0.122)	4 < 3 < 2 = 1
Problematic pornography use	0.016 (0.065)	-0.253 (0.056)	0.084 (0.075)	0.349 (0.159)	2 < 1 = 3 = 4
Satisfaction with life	0.210 (0.062)	0.091 (0.077)	-0.172 (0.077)	-0.442 (0.128)	4 = 3 < 2 = 1

Note. SE: standard error.; As correlates were estimated from factor scores saved from preliminary measurement models with a mean of 0 and a standard deviation of 1, zero signifies that a correlate is on an average level. Scores substantially higher than zero are considered above average, while scores substantially lower than zero are considered below average.

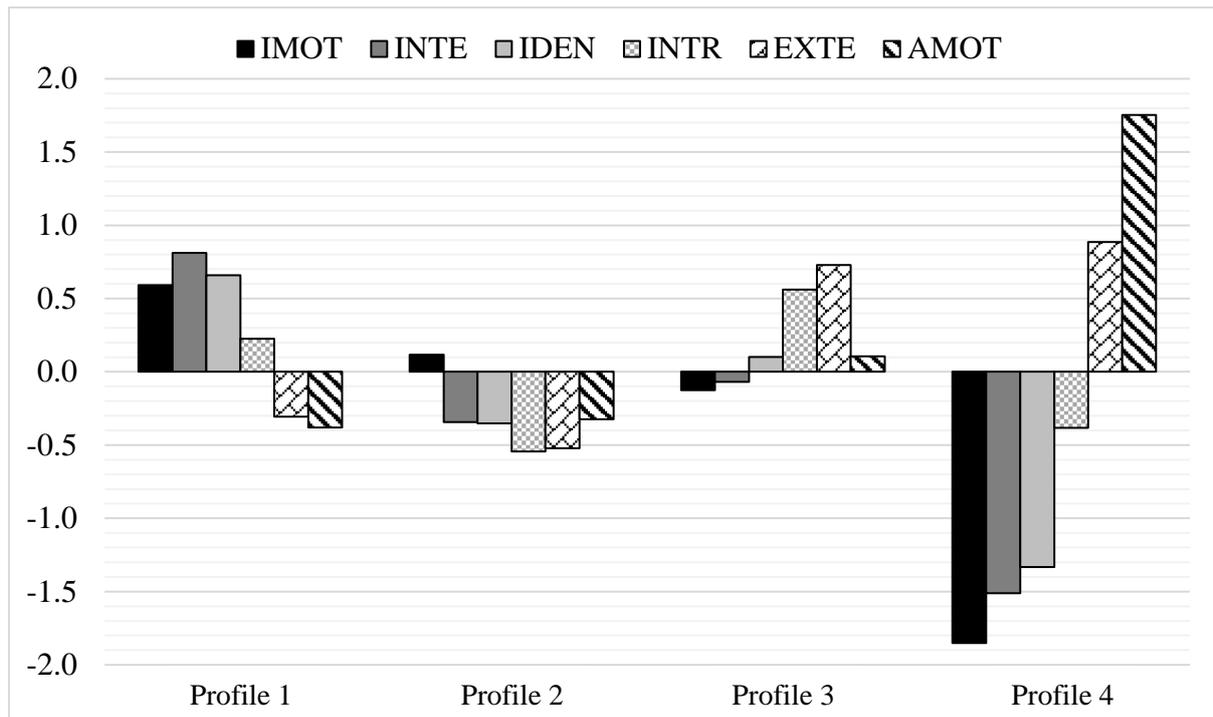


Figure 1

Characteristics of the sexual motivation profiles (Study 1)

Note. Indicators are estimated from factor scores saved from preliminary measurement models with a mean of 0 and a standard deviation of 1.; IMOT: intrinsic motivation; INTE: integrated motivation; IDEN: identified motivation; INTR: introjected motivation; EXTE: external motivation; AMOT: amotivation; Profile 1: highly self-determined; Profile 2: moderately self-determined; Profile 3: moderately non-self-determined; Profile 4: highly non-self-determined.

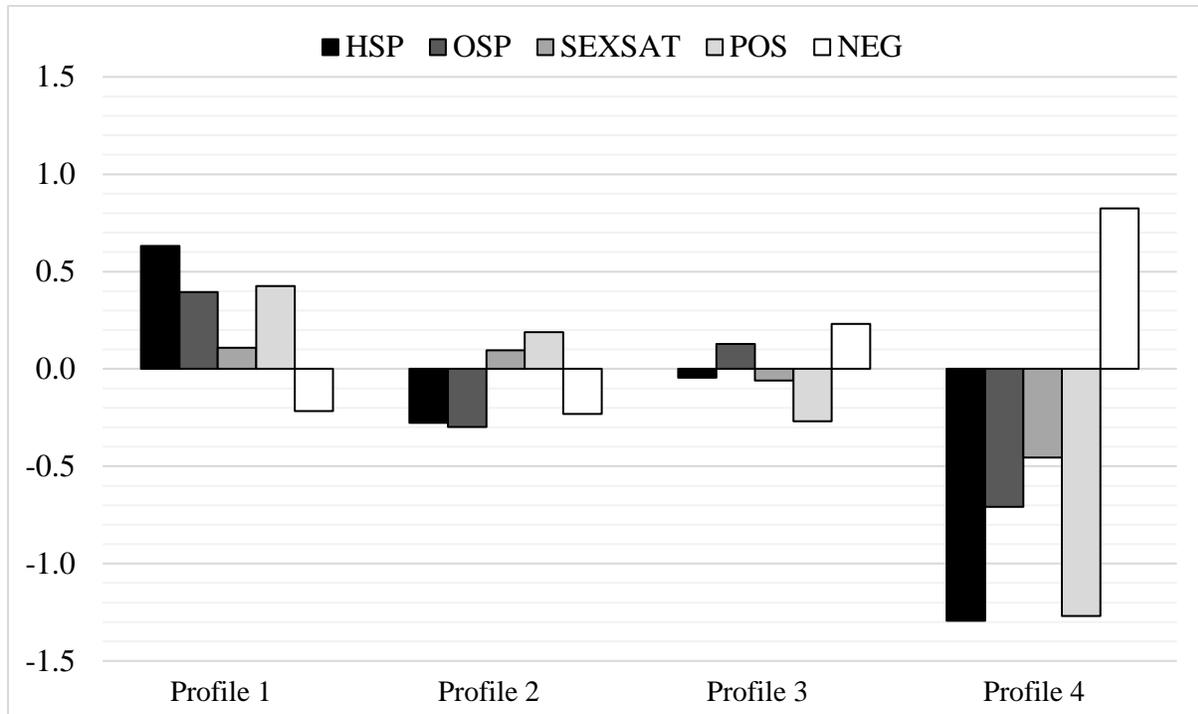


Figure 2

Levels of correlates in the final four-profile solution in Study 1

Note. All correlates are standardized with a mean of zero and a standard deviation of one.; HSP: harmonious sexual passion; OSP: obsessive sexual passion; POS: positive emotions during sex; NEG: negative emotions during sex; SEXSAT: sexual satisfaction; Profile 1: highly self-determined; Profile 2: moderately self-determined; Profile 3: moderately non-self-determined; Profile 4: highly non-self-determined.

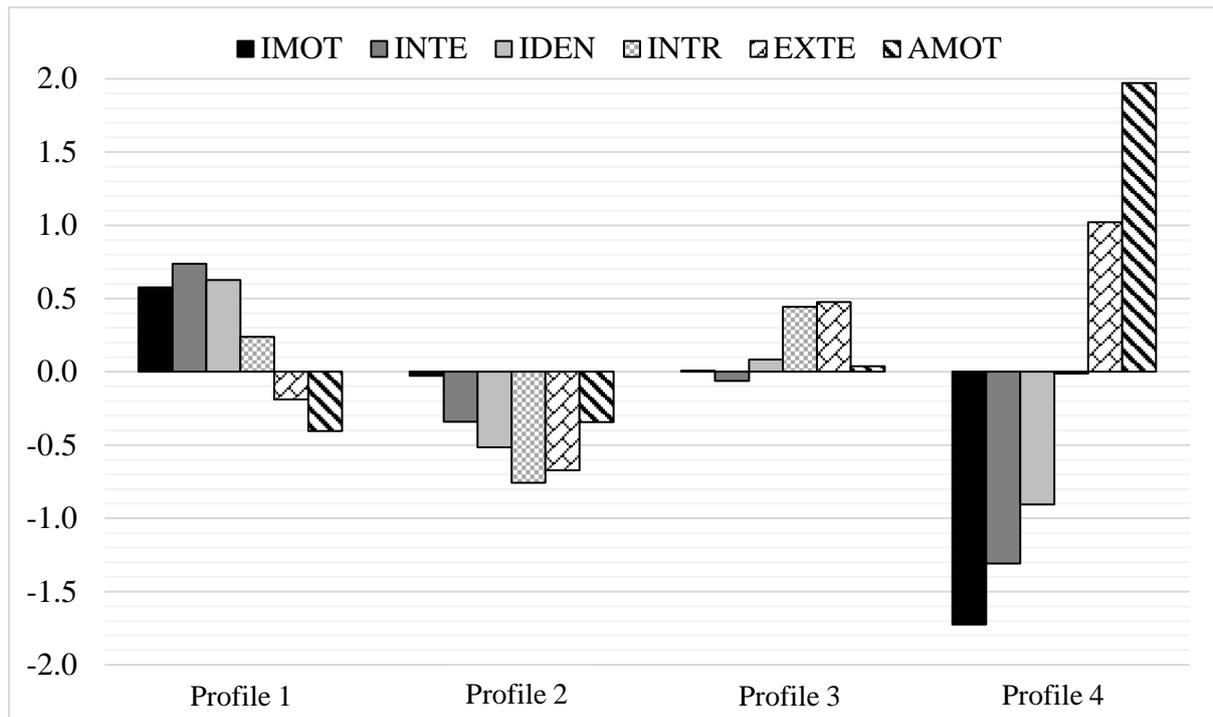


Figure 3

Characteristics of the sexual motivation profiles (Study 2)

Note. Indicators are estimated from factor scores saved from preliminary measurement models with a mean of 0 and a standard deviation of 1.; IMOT: intrinsic motivation; INTE: integrated motivation; IDEN: identified motivation; INTR: introjected motivation; EXTE: external motivation; AMOT: amotivation; Profile 1: highly self-determined; Profile 2: moderately self-determined; Profile 3: moderately non-self-determined; Profile 4: highly non-self-determined.

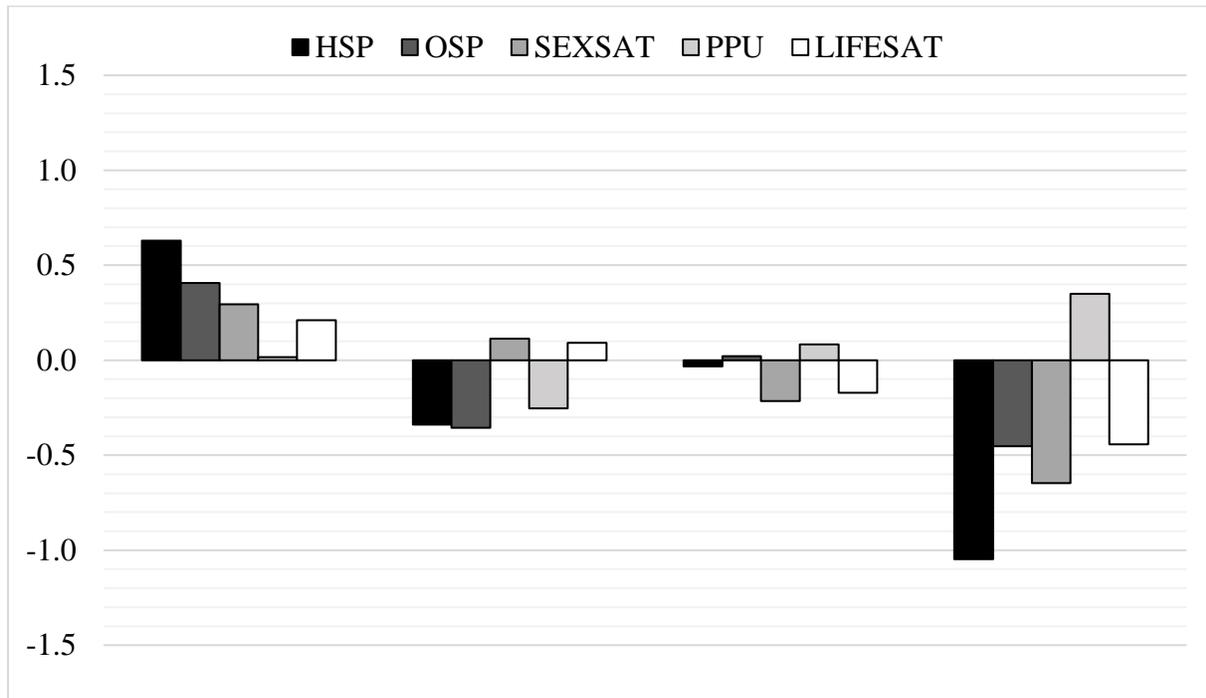


Figure 4

Levels of correlates in the final four-profile solution in Study 2

Note. All correlates are standardized with a mean of zero and a standard deviation of one.; HSP: harmonious sexual passion; OSP: obsessive sexual passion; SEXSAT: sexual satisfaction; PPU: problematic pornography use; LIFESAT: life satisfaction; Profile 1: highly self-determined; Profile 2: moderately self-determined; Profile 3: moderately non-self-determined; Profile 4: highly non-self-determined.

Online Supplements for:
Examining Sexual Motivation Profiles and Their Correlates Using Latent Profile Analysis

These online supplements are to be posted on the journal website and hot-linked to the manuscript. If the journal does not offer this possibility, these materials can alternatively be posted on one of our personal websites (we will adjust the in-text reference upon acceptance).

We would also be happy to have some of these materials brought back into the main manuscript, or included as published appendices if you deem it useful. We developed these materials to provide additional technical information and to keep the main manuscript from becoming needlessly long.

Table of Contents

Appendix 1: Hungarian and original English versions of the Sex Motivation Scale

Appendix 2: Estimation and results related to the preliminary measurement models

Appendix 3: Class enumeration procedure and selecting the optimal number of profiles in latent profile analysis

Appendix 4: Mplus syntax codes that were used in this research

References used in the online supplementary document

Appendix 1*Hungarian and original English versions of the Sex Motivation Scale*

	Hungarian Version	English Version (Gravel et al., 2016)
Title	Szexuális Motivációk Skála (SsexMS)	Sexual Motivation Scale (SexMS)
Instructions	Számos oka lehet annak, hogy az embereknek miért vannak szexuális kapcsolataik. A megfelelő szám bejelölésével értékeld, hogy az adott állítás milyen mértékben passzol azokhoz a motivációkhoz, amiért te szexuális életet élsz!	There are many reasons why people have sexual relationships. Please indicate to what extent each of the statements below corresponds to your motives for having sexual relationships in general by checking the appropriate number.
Rating Scale	1 – egyáltalán nem illik rám 2 – 3 – 4 – mérsékelten illik rám 5 – 6 – 7 – pontosan illik rám	1 – does not correspond at all 2 – 3 – 4 – corresponds moderately 5 – 6 – 7 – corresponds completely
Item 1 (Intrinsic)	Mert a szex jó móka.	Because sex is fun.
Item 2 (External)	Mert a partnerem elvárja tőlem.	Because my partner demands it of me.
Item 3 (Identified)	Mert a szexualitás egy normális és fontos része az önfejlesztésnek.	Because sexuality is a normal and important aspect of human development.
Item 4 (Amotivation)	Nem is tudom, úgy érzem, hogy felesleges.	I don't know; I feel it's not worth it.
Item 5 (Integrated)	Mert a szexualitás sokat ad az életemhez.	Because sexuality brings so much to my life.
Item 6 (Intrinsic)	Mert élvezem a szexet.	Because I enjoy sex.
Item 7 (Introjected)	Azért, hogy bizonyítsam magamnak azt, hogy szexuálisan vonzó vagyok.	To prove to myself that I am sexually attractive.
Item 8 (External)	Azért, hogy elkerüljem a konfliktusokat a partneremmel.	To avoid conflicts with my partner.
Item 9 (Amotivation)	Nem tudom, úgy érzem, hogy ez csak időpocsékolás.	I don't know; it feels like a waste of time.
Item 10 (Integrated)	Mert a szexualitás egy fontos része annak, aki vagyok.	Because sexuality is a key part of who I am.
Item 11 (External)	Mert nem akarom, hogy a partnerem kritizáljon.	Because I don't want to be criticized by my partner.
Item 12 (Identified)	Mert úgy érzem, hogy fontos a szexben kísérletezgetni.	Because I feel it's important to experiment sexually.
Item 13 (Amotivation)	Nem tudom, igazából unom a szexet.	I don't know; actually, I find it boring.
Item 14 (Introjected)	Azért, hogy bizonyítsam magamnak azt, hogy jó vagyok a szexben.	To show myself that I am sexually competent.
Item 15 (Integrated)	Mert a szex alapvető része az életemnek.	Because sexuality is a meaningful part of my life.
Item 16 (Intrinsic)	Azért az örömeért, amit akkor érzek, amikor a párom felizgat.	For the pleasure I feel when my partner stimulates me sexually.
Item 17 (Integrated)	Mert a szex egy meghatározó részét tölti ki az életemnek.	Because sexuality fulfills an essential aspect of my life.

	Hungarian Version	English Version (Gravel et al., 2016)
Item 18 (External)	Hogy megfeleljek a partnerem elvárásainak.	To live up to my partner's expectations.
Item 19 (Identified)	Mert szerintem fontos, hogy a szex által jobban megismerjem a testem.	Because I think it is important to learn to know my body better.
Item 20 (Introjected)	Hogy bebizonyítsam magamnak azt, hogy jó vagyok az ágyban.	To prove to myself that I am a good lover.
Item 21 (Intrinsic)	Mert a szex izgalmas.	Because sex is exciting.
Item 22 (Identified)	Mert úgy érzem, hogy fontos, hogy nyitottak legyünk az új élményekre.	Because I feel it's important to be open to new experiences.
Item 23 (Amotivation)	Nem tudom, a szex egy csalódás számomra.	I don't know; sex is a disappointment to me.
Item 24 (Introjected)	Azért, hogy bizonyítsam magamnak, hogy izgató vagyok.	To prove to myself that I have sex-appeal.

Appendix 2: Estimation and results related to the preliminary measurement models

In both studies, preliminary analyses were conducted to (1) examine the psychometric properties of the used instruments and to (2) create factors scores derived from these measurement models that served as a basis for the latent profile analysis (LPA). For the constructs of sexual motivation and sexual passion, alternative confirmatory factor analysis (CFA) and exploratory structural equation modeling (ESEM) models were contrasted and compared. This analytic decision was rooted in previous studies including both simulated and real-life data and which reported that using ESEM model is a viable alternative when assessing conceptually-related constructs within the same instrument (Morin, Arens, & Marsh, 2016; Morin, Arens, Tran, & Caci, 2016; Morin, Boudrias, Marsh, Madore, & Desrumeaux, 2016; Morin et al., 2017). More specifically, statistical research has shown that when meaningful cross-loadings are present in a model, forcing them to be zero (as in CFA) could lead to biased results in terms of model fit statistics and inflated factor correlations that, in turn, could undermine the discriminant validity of the factors (Asparouhov, Muthén, & Morin, 2015). On the other hand, freely estimating the same cross-loadings does not only result in a more precise representation of a construct, but also unbiased parameter estimates (Asparouhov & Muthén, 2009; Marsh, Lüdtke, Nagengast, Morin, & Von Davier, 2013).

In addition, prior studies within motivations (Guay, Morin, Litalien, Valois, & Vallerand, 2015; Howard, Gagné, Morin, & Forest, 2018; Litalien, Guay, & Morin, 2015; Litalien et al., 2017; Tóth-Király, Orosz, et al., 2017) and passion (Bonneville-Roussy & Vallerand, 2018; Marsh et al., 2013; Schellenberg, Gunnell, Mosewich, & Bailis, 2014; Tóth-Király, Bóthe, Rigó, & Orosz, 2017) have already shown the added value of ESEM relative to CFA. One advantage of ESEM-based models is the possibility to use target rotation (Asparouhov & Muthén, 2009; Browne, 2001), leading to the specification of ESEM in a confirmatory manner which closely mirrors CFA with the only difference pertaining to cross-loadings which are freely estimated, but targeted to be as close to zero as possible. In the case of the Passion Scale, based on previous studies (e.g., Marsh et al., 2013; Tóth-Király, Bóthe, et al., 2018; Schellenberg et al., 2018), correlated uniquenesses were also estimated between three pair of items. As for the other correlates in the studies (positive and negative emotions during sex in Study 1 as well as problematic pornography use and life satisfaction in Study 2), these correlates are distinct measurement instruments without any additional dimensionality being hypothesized, thus these factors were estimated with classical two-factor CFA representations.

Prior to the analyses of preliminary measurement models and LPA, the data was investigated for the prerequisites of multivariate analyses and structural equation modeling based on the guidelines of Field (2009). More specifically, univariate normality (i.e., the inspection of skewness and kurtosis values) was not achieved based on the guidelines of Muthén & Kaplan (1985): skewness values ranged between -1.685 (positive emotions) and 3.544 (amotivation) in Study 1 and between -1.519 (intrinsic) and 3.764 (amotivation) in Study 2, while kurtosis values ranged between -0.917 (introjected regulation) and 13.273 (amotivation) in Study 1 and between -0.889 (introjected) and 16.496 (amotivation) in Study 2. This observation was supported by the statistically significant Mardia's two-sided test for multivariate normality (Wang & Wang, 2012), suggesting that the assumption of multivariate normality was violated and taken into account in subsequent analyses. However, the independence of the residuals was supported by the Durbin-Watson statistic where all values clustered around 2. Finally, linearity and homoscedasticity were verified via the observation of scatterplots, histograms and normal P-P plots of the residuals. Overall, the assumptions were met.

All analyses were conducted with Mplus 8.1 (Muthén & Muthén, 1998-2017) and the robust maximum-likelihood (MLR) estimator which provides model fit statistics and standard errors that are robust to the non-normality of the data. To assess the adequacy of the measurement models, commonly reported goodness-of-fit indices were observed: the chi-square test (χ^2), the comparative fit index (CFI), the Tucker-Lewis Index (TLI), and the root mean square error of approximation

(RMSEA). CFA and TLI was deemed adequate or excellent if values were higher than .90 and .95, respectively. Conversely RMSEA was deemed acceptable and excellent with values smaller than .08 and .06, respectively (Hu & Bentler, 1999; Marsh, Hau, & Grayson, 2005). The chi-square test is reported for transparency, but it is not considered in model evaluation given its known oversensitivity to sample size and minor model misspecification (Marsh et al., 2005). Finally, we also report model-based composite reliability indices (McDonald, 1970) which were calculated from the standardized factor loadings and the error variances associated with the items of the instruments. We opted to use this index due to the issues associated with Cronbach's alpha (Rodriguez, Reise, & Haviland, 2016; Sijtsma, 2009).

The goodness-of-fit results pertaining to all measurement models in all studies are reported in Table S1 below. These results support the adequacy of the preliminary measurement models. Specifically, ESEM-based sexual motivations had superior fit relative to their CFA counterparts which aligns well with previous studies on motivations (e.g., Howard et al., 2018; Litalien et al., 2015; Litalien et al., 2017). Standardized parameter estimates associated with these models are presented in Table S2 for Study 1 and Table S3 for Study 2, while inter-factor correlations are reported in Table S4. These results show that all motivational factors were well-defined in both studies (as apparent by the moderate-to-high factor loadings). While two out of the 12 motivational factors had composite reliability values that were lower-bound acceptable (the IMOT factor in both studies), these findings are less concerning given that the present study relies on factor scores derived from latent variable models in which measurement error is controlled for.

A similar observation can be made for the Passion Scale in that the two-factor ESEM model outperformed the two-factor CFA model in model fit. The harmonious and obsessive passion factors were also well-defined (see Table S5) and had satisfactory levels of composite reliability. Correlations were moderate between the two factors ($r_{\text{Study 1}} = .468$; $r_{\text{Study 2}} = .506$). Lastly, all the remaining correlates had satisfactory model fit, and factors were also well-defined and had adequate composite reliability (see Table S6 for correlates of Study 1 and Table S7 for correlates of Study 2).

Table S1*Goodness-of-Fit Statistics for the Estimated Models in Study 1 and Study 2*

	Constructs	Model	χ^2	df	CFI	TLI	RMSEA	90% CI RMSEA
Study 1	Sexual motivation	Six-factor CFA	676.046*	237	.925	.912	.052	.048-.057
		Six-factor ESEM	336.683*	147	.967	.939	.044	.037-.050
	Sexual passion	Two-factor CFA	309.327*	50	.909	.880	.087	.078-.097
		Two-factor ESEM	188.567*	40	.948	.914	.074	.064-.085
	Emotions during sex	Two-factor CFA	97.397*	34	.954	.939	.052	.040-.065
Study 2	Sexual motivation	Six-factor CFA	737.245*	237	.920	.907	.058	.053-.063
		Six-factor ESEM	362.399*	147	.966	.935	.048	.042-.054
	Sexual passion	Two-factor CFA	323.265*	50	.889	.853	.093	.083-.103
		Two-factor ESEM	165.636*	40	.949	.916	.070	.060-.082
	Problematic pornography use, and satisfaction with life	Two-factor CFA	202.955*	43	.935	.917	.077	.066-.088

Note. CFA: Confirmatory factor analysis; ESEM: Exploratory structural equation modeling; χ^2 : Robust chi-square test of exact fit; df: Degrees of freedom; CFI: Comparative fit index; TLI: Tucker-Lewis index; RMSEA: Root mean square error of approximation; 90% CI: 90% confidence interval of the RMSEA; * $p < 0.01$.

Table S2*Standardized Parameter Estimates from the Six-Factor CFA and ESEM Solutions for the Sexual Motivation Scale in Study 1*

	CFA		ESEM						δ
	Factor (λ)	δ	Intrinsic (λ)	Integrated (λ)	Identified (λ)	Introjected (λ)	External (λ)	Amotivation (λ)	
Intrinsic motivation									
Item 1	.439**	.807	.426**	.132*	.051	.017	.074	.087	.755
Item 6	.791**	.374	.721**	.038	-.052	.032	-.071	-.168*	.257
Item 16	.640**	.590	.324**	.232**	.047	.094*	.028	-.140*	.591
Item 21	.824**	.321	.505**	.023	.339**	.039	-.129**	-.036	.309
ω	.776		.671						
Integrated motivation									
Item 5	.802**	.357	.140*	.640**	.055	-.027	-.033	-.047	.364
Item 10	.766**	.414	-.028	.619**	.210**	.033	-.012	-.021	.401
Item 15	.872**	.240	-.024	.930**	-.038	-.046*	.031	-.030	.210
Item 17	.889**	.210	.062	.907**	-.064	.010	-.027	.035	.190
ω	.901		.892						
Identified motivation									
Item 3	.561**	.685	.134	.172**	.336**	.050	.038	.048	.697
Item 12	.645**	.584	.051	-.010	.671**	-.063	.117**	-.054	.538
Item 19	.610**	.628	-.160*	.155	.537**	.201**	-.135**	.007	.544
Item 22	.765**	.415	.223**	-.042	.677**	-.072*	.004	-.041	.383
ω	.742				.695				
Introjected motivation									
Item 7	.746**	.443	.086	-.002	-.054	.693**	.164**	-.031	.437
Item 14	.847**	.283	.044	-.039	-.028	.842**	.035	.051	.289
Item 20	.882**	.222	-.008	-.023	.026	.905**	-.034	-.006	.195
Item 24	.826**	.318	-.028	.024	.057	.815**	-.034	.025	.313
ω	.896					.896			
External motivation									
Item 2	.625**	.610	.060	-.028	-.057	-.029	.624**	.058	.587
Item 8	.777**	.397	.007	-.001	.006	.004	.734**	.071	.407
Item 11	.792**	.373	-.079	-.005	.062	-.041	.754**	.053	.371
Item 18	.608**	.631	-.029	.004	.025	.209**	.614**	-.127*	.552
ω	.796						.795		
Amotivation									
Item 4	.755**	.429	.012	-.102	.003	.003	-.021	.734**	.420
Item 9	.810**	.343	.152*	.029	-.052	.036	-.050	.998**	.200
Item 13	.805**	.353	-.178	.049	-.012	-.069*	.141	.608**	.377
Item 23	.708**	.499	-.231	-.024	.071	.080*	.057	.507**	.518
ω	.854							.842	

Note. CFA: Confirmatory factor analysis; ESEM: Exploratory structural equation modeling; λ : Factor loading; δ : Item uniqueness; ω : model-based omega composite reliability; Target factor loadings are in bold.; * $p < .05$; ** $p < .01$.

Table S3*Standardized Parameter Estimates from the Six-Factor CFA and ESEM Solutions for the Sexual Motivation Scale in Study 2*

	CFA		ESEM						δ
	Factor (λ)	δ	Intrinsic (λ)	Integrated (λ)	Identified (λ)	Introjected (λ)	External (λ)	Amotivation (λ)	
Intrinsic motivation									
Item 1	.464**	.785	.323**	-.065	.331**	-.044	.102*	-.067	.720
Item 6	.827**	.316	.576**	.171**	-.034	.008	-.032	-.269**	.276
Item 16	.706**	.502	.488**	.271**	-.074	.096**	-.048	-.092*	.484
Item 21	.812**	.341	.602**	.049	.297**	.026	-.073*	-.049	.285
ω	.802		.691						
Integrated motivation									
Item 5	.772**	.405	.012	.613**	.133*	-.049	.027	-.183**	.392
Item 10	.776**	.397	-.107*	.711**	.228**	.004	-.028	.011	.352
Item 15	.845**	.286	.132**	.813**	-.060	.021	-.017	.022	.269
Item 17	.836**	.301	.111*	.858**	-.045	-.009	.025	.100*	.267
ω	.882		.875						
Identified motivation									
Item 3	.621**	.614	-.039	.113*	.599**	-.028	.051	-.090*	.548
Item 12	.639**	.592	.131*	.099	.501**	.034	.027	.042	.597
Item 19	.627**	.607	-.084	.195**	.470**	.171**	.006	-.051	.571
Item 22	.730**	.467	.391**	.015	.487**	.055	-.069	.080	.457
ω	.750				.661				
Introjected motivation									
Item 7	.752**	.435	.018	-.067	.036	.705**	.112**	-.097**	.427
Item 14	.880**	.225	.012	.029	-.024	.861**	.032	.021	.230
Item 20	.895**	.198	.028	-.033	.060	.882**	-.004	.045	.191
Item 24	.856**	.267	-.032	.014	-.018	.883**	-.040	.030	.257
ω	.910					.909			
External motivation									
Item 2	.739**	.455	.041	-.079*	.063	-.020	.733**	.028	.444
Item 8	.846**	.283	-.010	.020	-.067	-.019	.851**	.038	.260
Item 11	.812**	.340	-.062	.075	.000	-.052	.820**	.021	.339
Item 18	.687**	.528	.033	-.010	.014	.207**	.611**	-.039	.490
ω	.855						.856		
Amotivation									
Item 4	.778**	.395	.060	-.067	.011	.004	-.037	.821**	.360
Item 9	.832**	.308	.137*	.025	-.056	-.045	.112**	.877**	.233
Item 13	.835**	.303	-.143**	.040	.000	.032	.076*	.716**	.325
Item 23	.728**	.470	-.349**	.025	.091	.058	-.046	.583**	.417
ω	.872							.871	

Note. CFA: Confirmatory factor analysis; ESEM: Exploratory structural equation modeling; λ : Factor loading; δ : Item uniqueness; ω : model-based omega composite reliability; Target factor loadings are in bold.; * $p < .05$; ** $p < .01$.

Table S4*Latent Factor Correlations from the Six-Factor CFA and ESEM Solutions for the Sexual Motivation Scale in Study 1 and Study 2*

		Intrinsic	Integrated	Identified	Introjected	External	Amotivation
Study 1	Intrinsic motivation	—	.619**	.522**	.111**	-.310**	-.605**
	Integrated regulation	.768**	—	.644**	.249**	-.171**	-.409**
	Identified regulation	.792**	.738**	—	.333**	-.124*	-.301**
	Introjected regulation	.188**	.224**	.336**	—	.314**	.001
	External regulation	-.414**	-.216**	-.165**	.345**	—	.494**
	Amotivation	-.731**	-.470**	-.425**	.031**	.567**	—
Study 2	Intrinsic motivation	—	.538**	.410**	.114*	-.136*	-.506**
	Integrated regulation	.760**	—	.563**	.228**	-.078	-.398**
	Identified regulation	.739**	.742**	—	.318**	.066	-.228**
	Introjected regulation	.160**	.228**	.388**	—	.453**	.049
	External regulation	-.242**	-.085	.037	.475**	—	.483**
	Amotivation	-.691**	-.422**	-.335**	.096	.543**	—

Note. CFA: Confirmatory factor analysis; ESEM: Exploratory structural equation modeling; Values above the diagonal are from the ESEM model; Values below the diagonal are from the CFA model.; * $p < .05$; ** $p < .01$.

Table S5*Standardized Parameter Estimates from the Two-Factor CFA and ESEM Solutions for the Passion Scale in Study 1 and 2*

Items	Study 1						Study 2					
	CFA			ESEM			CFA			ESEM		
	HP (λ)	OP (λ)	δ	HP (λ)	OP (λ)	δ	HP (λ)	OP (λ)	δ	HP (λ)	OP (λ)	δ
Harmonious passion												
Item 1	.465**		.784	.514**	-.088*	.771	.442**		.804	.496**	-.126*	.802
Item 3	.773**		.403	.816**	-.058	.375	.717**		.487	.749**	-.017	.452
Item 5	.694**		.518	.595**	.166**	.525	.745**		.444	.653**	.145**	.457
Item 6	.814**		.337	.821**	-.007	.330	.773**		.402	.816**	-.021	.351
Item 8	.568**		.677	.453**	.224**	.650	.646**		.582	.445**	.263**	.615
Item 10	.457**		.792	.537**	-.139**	.762	.399**		.840	.472**	-.189**	.832
ω	.802			.848			.795			.790		
Obsessive passion												
Item 2		.688**	.527	.043	.658**	.538		.659**	.566	-.047	.715**	.521
Item 4		.786**	.383	.177**	.689**	.380		.774**	.401	.115*	.734**	.362
Item 7		.705**	.503	-.003	.713**	.494		.655**	.571	.082	.599**	.585
Item 9		.738**	.455	.007	.735**	.456		.681**	.537	-.048	.710**	.528
Item 11		.688**	.527	.044	.663**	.532		.692**	.521	.153**	.590**	.537
Item 12		.740**	.452	-.156**	.839**	.394		.723**	.477	-.107**	.790**	.450
ω		.869			.872			.851			.852	

Note. CFA: Confirmatory factor analysis; ESEM: Exploratory structural equation modeling; HP: harmonious passion; OP: obsessive passion; λ : Factor loading; δ : Item uniqueness; ω : model-based omega composite reliability; Target factor loadings are in bold.; * $p < .05$; ** $p < .01$.

Table S6

Standardized Parameter Estimates from the Two-Factor CFA Solutions for the Sexual Emotion Scale in Study 1

	POS (λ)	NEG (λ)	δ
Positive emotions during sex			
Item 1	.689**		.526
Item 3	.802**		.357
Item 5	.766**		.414
Item 7	.766**		.414
Item 9	.821**		.326
ω	.879		
Negative emotions during sex			
Item 2		.331**	.890
Item 4		.688**	.526
Item 6		.677**	.542
Item 8		.412**	.830
Item 10		.664**	.558
ω		.697	

Note. CFA: Confirmatory factor analysis; POS: positive emotions during sex; NEG: negative emotions during sex; λ : Factor loading; δ : Item uniqueness; ω : model-based omega composite reliability; Target factor loadings are in bold.; * $p < .05$; ** $p < .01$

Table S7

Standardized Parameter Estimates from the Two-Factor CFA Solutions for the Sexual Emotion Scale in Study 1

	PPU (λ)	LS (λ)	δ
Problematic pornography use			
Item 1	.557**		.690
Item 2	.546**		.701
Item 3	.632**		.601
Item 4	.653**		.573
Item 5	.870**		.243
Item 6	.837**		.299
ω	.844		
Life satisfaction			
Item 1		.831**	.310
Item 2		.740**	.453
Item 3		.905**	.181
Item 4		.741**	.450
Item 5		.713**	.491
ω		.891	

Note. CFA: Confirmatory factor analysis; PPU: problematic pornography use; LS: life satisfaction; λ : Factor loading; δ : Item uniqueness; ω : model-based omega composite reliability; Target factor loadings are in bold.; * $p < .05$; ** $p < .01$.

Appendix 3: Class enumeration procedure and selecting the optimal number of profiles in latent profile analysis

In order to identify the optimal number of profiles, the substantive meaningfulness of the profiles, their theoretical adequacy and the statistical adequacy of the solutions should be evaluated (Bauer & Curran, 2003; Marsh, Lüdtke, Trauwain, & Morin, 2009; Morin, 2016). Meaningfulness and theoretical adequacy refer to the substantive meaning and the theoretical interpretability of the profiles which is rooted in previous theoretical and empirical works in the present case (e.g., Gillet, Morin, & Reeve, 2018; Howard, Gagné, Morin, & Van den Broeck, 2016). As for statistical adequacy, a variety of indicators were examined which reveal important information about the adequacy of the profiles solutions: the Akaike Information Criterion (AIC), the Bayesian Information Criterion (BIC), the Constant AIC (CAIC), the Sample-Size-Adjusted BIC (SSABIC), the adjusted Lo-Mendell-Rubin (aLMR) likelihood ratio test, and the Bootstrap Likelihood Ratio Test (BRLT). While not considered in profile selection (Lubke & Muthén, 2007; Peugh & Fan, 2015), entropy values are often reported as well which show the precision of the classification with values ranging from 0 (lower accuracy) to 1 (higher accuracy).

Both the aLMR test and the BLRT compares the estimated model (e.g., four profiles) with a model having one less class (e.g., three profiles) and a non-significant p-value ($p > .050$) suggests that the model with one less class should be accepted. As for the information criteria, lower values on AIC, BIC, CAIC, and SSABIC suggest a better fitting model. However, more often than not, these indicators keep getting lower with the inclusion of additional profiles, suggesting that more profiles are better which is often not the case. For this reason, a graphical examination of “elbow plots” could facilitate the decision-making process where the point after which the slope flattens indicates that the optimal number of profiles have been reached and that the addition of other profiles does not contribute reasonably. Of major relevance is a recent simulation study (Diallo, Morin, & Lu, 2017) showing that BIC and CAIC should be preferred under conditions of high classification accuracy (i.e., entropy higher than .800), while SSABIC and BLRT should be preferred under conditions of low classification accuracy (i.e., entropy under .500; see also Howard et al., 2016)

Fit indices associated with the LPA solutions are reported in the upper part of Table S8 for Study 1 and the lower part of Table S8 for Study 2. Entropy values were high across all solutions, suggesting high levels of classification accuracy. Following the above-mentioned suggestion of Diallo et al. (2017), we rely on the BIC and CAIC indices for profile selection and simply report and plot the other indices for transparency. As expected, BIC and CAIC values continuously decreased with the inclusion of additional profiles without reaching an endpoint. For this reason, the graphical representation of these information criteria was examined (see the left-hand part of Figure S1 for Study 1 and the right-hand part of Figure S1 for Study 2), showing that all four indices reached a plateau around four profiles. Instead of arbitrary profile selection, we observed the adjacent 3- and 5-profile solutions as well which revealed that the addition of a fourth profile resulted in the addition of a meaningful and distinct profile to the solution, while adding a fifth profile simply divided an existing profile into two smaller ones that did not differ from one another substantially. It is also important to note that classification probabilities were high for this four-profile solution (see Table S9). On the basis of these information, the four-profiles solution was retained for interpretation and the subsequent analyses as the final solution (see Table S10 for the exact profile means and variances).

Table S8*Fit Statistics for the Latent Profiles and Class Enumeration*

Model	LL	# of fp	Scaling	AIC	CAIC	BIC	SSABIC	Entropy	aLMR	BLRT
<i>Study 1</i>										
1 Profile	-5488.656	12	2.071	11001.313	11067.560	11055.560	11017.459	—	—	—
2 Profiles	-3782.770	25	1.175	7615.540	7753.555	7728.555	7649.177	.933	< .001	< .001
3 Profiles	-3401.296	38	2.409	6878.593	7088.376	7050.376	6926.722	.890	.568	< .001
4 Profiles	-3174.007	51	1.473	6450.015	6731.567	6680.567	6518.636	.877	.040	< .001
5 Profiles	-3012.364	64	1.671	6152.728	6506.047	6442.047	6238.840	.886	.461	< .001
6 Profiles	-2892.197	77	1.328	5938.395	6363.483	6286.483	6041.999	.867	.222	< .001
7 Profiles	-2797.090	90	1.185	5774.180	6271.036	6181.036	5895.276	.882	.132	< .001
8 Profiles	-2711.728	103	1.297	5629.456	6198.080	6095.080	5768.043	.880	.409	< .001
<i>Study 2</i>										
1 Profile	-5103.000	12	1.960	10230.001	10295.387	10283.387	10245.289	—	—	—
2 Profiles	-3891.884	25	1.715	7833.769	7969.991	7944.991	7865.619	.887	< .001	< .001
3 Profiles	-3532.370	38	1.391	7140.740	7347.798	7309.798	7189.152	.866	< .001	< .001
4 Profiles	-3302.290	51	1.729	6706.580	6984.473	6933.473	6771.554	.853	.438	< .001
5 Profiles	-3127.139	64	1.416	6382.277	6731.006	6667.006	6463.813	.868	.149	< .001
6 Profiles	-2982.419	77	1.278	6118.838	6538.402	6461.402	6216.936	.882	.032	< .001
7 Profiles	-2885.293	90	1.255	5950.586	6440.986	6350.986	6065.246	.881	.080	< .001
8 Profiles	-2815.439	103	1.204	5836.878	6398.114	6295.114	5968.099	.874	.088	< .001

Note. LL: loglikelihood; # of fp: number of free parameters; AIC: Akaike Information Criterion; CAIC: constant AIC; BIC: Bayesian Information Criterion; SSABIC: Sample-Size Adjusted BIC; LMR: p-value associated with the adjusted Lo-Mendell-Rubin likelihood ratio test. Bold values indicate that the four-profile solution was selected as the final model.

Table S9*Classification Probabilities for the Most Likely Latent Profile Membership (Column) by Latent Profile (Row) across Study 1 and 2*

	Highly self-determined	Moderately self-determined	Moderately non-self-determined	Highly non-self-determined
<i>Study 1</i>				
Highly self-determined (P1)	.965	.021	.014	.000
Moderately self-determined (P2)	.053	.923	.024	.000
Moderately non-self-determined (P3)	.019	.052	.907	.022
Highly non-self-determined (P4)	.000	.014	.075	.911
<i>Study 2</i>				
Highly self-determined (P1)	.936	.038	.026	.000
Moderately self-determined (P2)	.064	.920	.013	.003
Moderately non-self-determined (P3)	.048	.042	.891	.019
Highly non-self-determined (P4)	.000	.011	.055	.934

Note. P: profile.

Table S10*Exact means of the different sexual motivation factors in the final retained 4-profile solution*

	Highly self-determined		Moderately self-determined		Moderately non-self-determined		Highly non-self-determined	
	Mean	Variance	Mean	Variance	Mean	Variance	Mean	Variance
<i>Study 1</i>								
IMOT	.591	.027	.116	.153	-.126	.315	-1.852	1.339
INTE	.812	.105	-.344	.456	-.068	.558	-1.511	.615
IDEN	.659	.194	-.353	.403	.102	.440	-1.332	.895
INTR	.226	.983	-.543	.412	.561	.711	-.383	.687
EXTE	-.307	.265	-.522	.093	.729	.783	.885	1.756
AMOT	-.381	.002	-.324	.006	.106	.197	1.754	3.265
<i>Study 2</i>								
IMOT	.576	.051	-.027	.334	.007	.298	-1.725	1.648
INTE	.737	.258	-.340	.675	-.062	.477	-1.308	.759
IDEN	.626	.243	-.515	.589	.084	.434	-.906	.935
INTR	.239	.952	-.757	.261	.443	.670	-.012	1.009
EXTE	-.188	.369	-.673	.031	.477	.779	1.021	1.970
AMOT	-.405	.002	-.343	.010	.039	.161	1.971	2.902

Note. IMOT: intrinsic motivation; INTE: integrated motivation; IDEN: identified motivation; INTR: introjected motivation; EXTE: external motivation; AMOT: amotivation; Factors were estimated from factor scores with a mean of 0 and a standard deviation of 1.

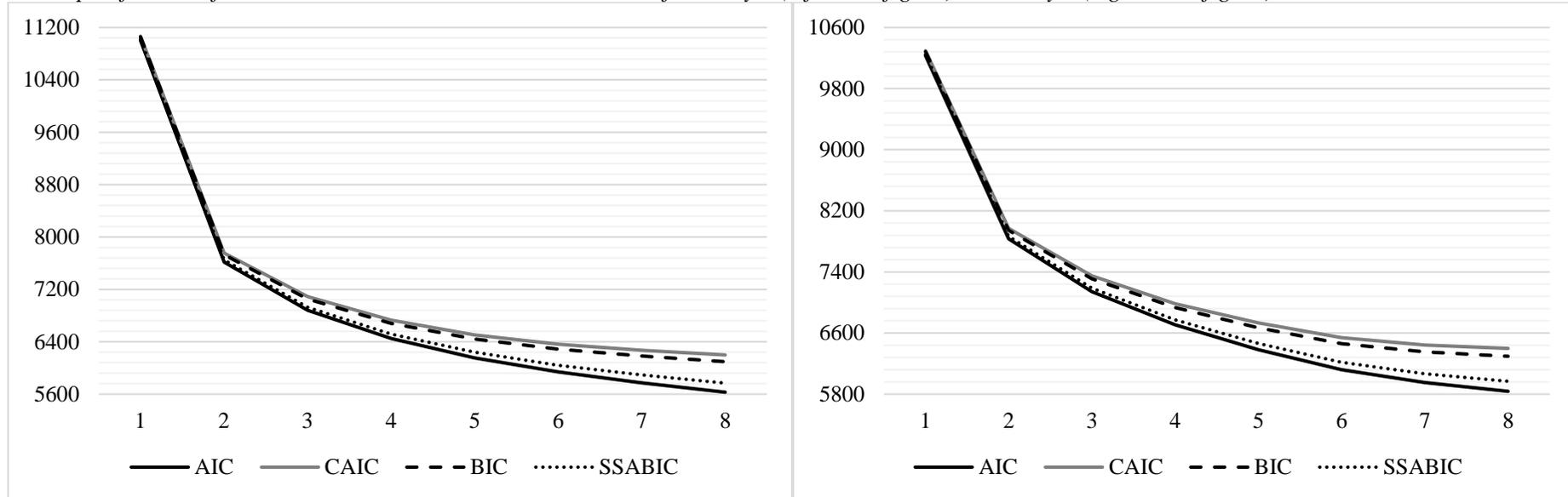
Table S11*Between-profile outcome comparisons and corresponding effect sizes in Study 1 and Study 2*

Variables	Study 1			Variables	Study 2		
	χ^2	p	d		χ^2	p	d
<i>Harmonious passion</i>				<i>Harmonious passion</i>			
Overall test	410.104	< .001	—	Overall test	247.278	< .001	—
P1 vs. P2	163.272	< .001	1.306	P1 vs. P2	139.108	< .001	1.248
P1 vs. P3	83.235	< .001	.972	P1 vs. P3	73.863	< .001	.910
P1 vs. P4	285.114	< .001	2.620	P1 vs. P4	204.685	< .001	2.227
P2 vs. P3	5.078	.024	.316	P2 vs. P3	11.670	.001	.378
P2 vs. P4	82.039	< .001	1.290	P2 vs. P4	31.137	< .001	.811
P3 vs. P4	106.881	< .001	1.546	P3 vs. P4	67.854	< .001	1.267
<i>Obsessive passion</i>				<i>Obsessive passion</i>			
Overall test	170.036	< .001	—	Overall test	84.276	< .001	—
P1 vs. P2	65.560	< .001	.762	P1 vs. P2	62.448	< .001	.814
P1 vs. P3	6.445	.011	.267	P1 vs. P3	15.235	< .001	.405
P1 vs. P4	129.752	< .001	1.185	P1 vs. P4	48.219	< .001	.903
P2 vs. P3	18.455	< .001	.490	P2 vs. P3	13.869	< .001	.473
P2 vs. P4	20.069	< .001	.556	P2 vs. P4	.585	.444	.098
P3 vs. P4	56.936	< .001	.947	P3 vs. P4	13.243	< .001	.519
<i>Sexual satisfaction</i>				<i>Sexual satisfaction</i>			
Overall test	19.668	< .001	—	Overall test	38.243	< .001	—
P1 vs. P2	.016	.900	.012	P1 vs. P2	3.038	.081	.183
P1 vs. P3	2.555	.110	.162	P1 vs. P3	23.036	< .001	.506
P1 vs. P4	18.684	< .001	.539	P1 vs. P4	45.875	< .001	.938
P2 vs. P3	1.969	.164	.155	P2 vs. P3	8.872	.003	.329
P2 vs. P4	17.062	< .001	.545	P2 vs. P4	27.520	< .001	.768
P3 vs. P4	7.934	.005	.402	P3 vs. P4	8.551	.003	.426
<i>Positive emotions</i>				<i>Problematic pornography use</i>			
Overall test	183.208	< .001	—	Overall test	23.759	< .001	—
P1 vs. P2	15.257	< .001	.382	P1 vs. P2	9.444	.002	.307
P1 vs. P3	68.587	< .001	.962	P1 vs. P3	.446	.504	.070
P1 vs. P4	115.337	< .001	2.018	P1 vs. P4	3.768	.052	.313
P2 vs. P3	26.590	< .001	.602	P2 vs. P3	12.795	< .001	.394
P2 vs. P4	82.647	< .001	1.617	P2 vs. P4	12.704	< .001	.640
P3 vs. P4	33.873	< .001	.936	P3 vs. P4	2.185	.139	.245
<i>Negative emotions</i>				<i>Life satisfaction</i>			
Overall test	73.290	< .001	—	Overall test	19.315	< .001	—
P1 vs. P2	.074	.785	.025	P1 vs. P2	1.321	.250	.124
P1 vs. P3	28.369	< .001	.583	P1 vs. P3	14.704	< .001	.401
P1 vs. P4	36.899	< .001	1.087	P1 vs. P4	21.003	< .001	.679
P2 vs. P3	35.975	< .001	.721	P2 vs. P3	5.568	.018	.264
P2 vs. P4	39.386	< .001	1.210	P2 vs. P4	12.723	< .001	.521
P3 vs. P4	11.312	.001	.556	P3 vs. P4	3.310	.077	.267

Note. P1-P4: profile; χ^2 : chi-square value; p: statistical significance value associated with the chi-square value; d: Cohen's (1988) effect size which were calculated on the basis of Lipsey and Wilson (2001) and should be interpreted in line the thresholds established by Cohen (0.20: small; 0.50: medium; 0.80: large)

Figure S1

Elbow plot for the information criteria used in class enumeration for Study 1 (left-hand figure) and Study 2 (right-hand figure)



Note. AIC: Akaike Information Criterion; BIC: the Bayesian Information Criterion; CAIC: Constant AIC; SSABIC: Sample-Size-Adjusted BIC

Appendix 4: Mplus syntax codes used in the present research**Title: Confirmatory factor analysis (CFA)**

! Lines starting with an exclamation mark are comments that are ignored by Mplus.

! Commands are the same unless stated otherwise.

! Identification of the data file.

DATA:

FILE IS C:\study1.dat;

! The variables function includes all variables in the data file.

VARIABLE:

! How missing data is coded.

MISSING ARE ALL (9999);

! All variables in the data file.

NAMES ARE

id gender sexsat

im1 exter2 iden3 am4 inte5 im6 intro7 exter8 am9 inte10 exter11 iden12 am13

intro14 inte15 im16 inte17 exter18 iden19 intro20 im21 iden22 am23 intro24

hp1 op2 hp3 op4 hp5 hp6 op7 hp8 op9 hp10 op11 op12 cp13 cp14 cp15 cp16 cp17

pos1 neg2 pos3 neg4 pos5 neg6 pos7 neg8 pos9 neg10;

! Variables used during the analyses.

USEVARIABLES ARE

im1 exter2 iden3 am4 inte5 im6 intro7 exter8 am9 inte10 exter11 iden12 am13

intro14 inte15 im16 inte17 exter18 iden19 intro20 im21 iden22 am23 intro24;

! The robust maximum likelihood estimator is used to address non-normality.

ANALYSIS:

estimator = mlr;

! A six-factor CFA model is with the factors being defined by their target items (using the BY ! command).

! All factor loadings are freely estimated (*) and the factor variances are fixed to 1 (@1).

MODEL:

imot BY im1* im6 im16 im21;

inte BY inte5* inte10 inte15 inte17;

iden BY iden3* iden12 iden19 iden22;

intr BY intro7* intro14 intro20 intro24;

exte BY exter2* exter8 exter11 exter18;

amot BY am4* am9 am13 am23;

imot@1; inte@1; iden@1; intr@1; exte@1; amot@1;

! Standardized parameter estimates are requested.

OUTPUT: stdyx;

Title: Exploratory Structural Equation Modeling (ESEM)

DATA:

FILE IS C:\study1.dat;

VARIABLE:

MISSING ARE ALL (9999);

NAMES ARE

id gender sexsat

im1 exter2 iden3 am4 inte5 im6 intro7 exter8 am9 inte10 exter11 iden12 am13

intro14 inte15 im16 inte17 exter18 iden19 intro20 im21 iden22 am23 intro24

hp1 op2 hp3 op4 hp5 hp6 op7 hp8 op9 hp10 op11 op12 cp13 cp14 cp15 cp16 cp17

pos1 neg2 pos3 neg4 pos5 neg6 pos7 neg8 pos9 neg10;

USEVARIABLES ARE

im1 exter2 iden3 am4 inte5 im6 intro7 exter8 am9 inte10 exter11 iden12 am13

intro14 inte15 im16 inte17 exter18 iden19 intro20 im21 iden22 am23 intro24;

! Oblique target rotation is used in ESEM.

ANALYSIS:

estimator = mlr;

rotation = target;

! Cross loadings are estimated and “targeted” to be zero with the ‘(~0)’ command.

! ESEM factors are identified with the ‘(*1)’ command.

MODEL:

imot BY im1 im6 im16 im21

inte5~0 inte10~0 inte15~0 inte17~0

iden3~0 iden12~0 iden19~0 iden22~0

intro7~0 intro14~0 intro20~0 intro24~0

exter2~0 exter8~0 exter11~0 exter18~0

am4~0 am9~0 am13~0 am23~0 (*1);

inte BY im1~0 im6~0 im16~0 im21~0

inte5 inte10 inte15 inte17

iden3~0 iden12~0 iden19~0 iden22~0

intro7~0 intro14~0 intro20~0 intro24~0

exter2~0 exter8~0 exter11~0 exter18~0

am4~0 am9~0 am13~0 am23~0 (*1);

iden BY im1~0 im6~0 im16~0 im21~0

inte5~0 inte10~0 inte15~0 inte17~0

iden3 iden12 iden19 iden22

intro7~0 intro14~0 intro20~0 intro24~0

exter2~0 exter8~0 exter11~0 exter18~0

am4~0 am9~0 am13~0 am23~0 (*1);

intr BY im1~0 im6~0 im16~0 im21~0

inte5~0 inte10~0 inte15~0 inte17~0

iden3~0 iden12~0 iden19~0 iden22~0

intro7 intro14 intro20 intro24

exter2~0 exter8~0 exter11~0 exter18~0

```
am4~0 am9~0 am13~0 am23~0 (*1);
```

```
exte BY im1~0 im6~0 im16~0 im21~0  
inte5~0 inte10~0 inte15~0 inte17~0  
iden3~0 iden12~0 iden19~0 iden22~0  
intro7~0 intro14~0 intro20~0 intro24~0  
exter2 exter8 exter11 exter18  
am4~0 am9~0 am13~0 am23~0 (*1);
```

```
amot BY im1~0 im6~0 im16~0 im21~0  
inte5~0 inte10~0 inte15~0 inte17~0  
iden3~0 iden12~0 iden19~0 iden22~0  
intro7~0 intro14~0 intro20~0 intro24~0  
exter2~0 exter8~0 exter11~0 exter18~0  
am4 am9 am13 am23 (*1);
```

OUTPUT: stdyx;

! The measurement model is saved as factor score as used as input for the subsequent LPA.

SAVEDATA:

```
file is sexmotesem.dat;
```

```
save is fscores;
```

Title: Latent profile analysis

DATA:

FILE IS C:\study1.dat;

VARIABLE:

NAMES ARE

id gender sexsat
 imot inte iden intr exte amot
 sdt2 imot2 inte2 iden2 intr2 exte2 amot2
 hp op pos neg;

USEVARIABLES ARE

imot inte iden intr exte amot;

! The classes function specifies the number of profiles to be estimated.

CLASSES = c(4);

! The auxiliary (e) function is used to compare profiles along the correlates.

! This should only be done after the class enumeration process is finalized.

AUXILIARY = hp(e) op(e) sexsat(e) pos(e) neg(e);

! The robust maximum likelihood estimator was used.

! For latent profile analyses, type = mixture should be specified.

! Start values (number of random starts and the number retained for the final optimization) are used to

! avoid converging on improper solutions.

! The number of iterations is specified with the stiteration function.

ANALYSIS:

estimator = mlr;
 type = mixture;
 starts = 5000 1000;
 stiterations = 200;

! The %overall% section describes the global specifications.

! Profile-specific statements are below the global one (e.g., %c#1%).

! Means and the variances of the profile indicators are freely estimated by specifying the factor names in brackets [] and the names of the profiles, respectively.

MODEL:

%overall%

%c#1%
 [imot inte iden intr exte amot];
 imot inte iden intr exte amot;

%c#2%
 [imot inte iden intr exte amot];
 imot inte iden intr exte amot;

%c#3%
 [imot inte iden intr exte amot];
 imot inte iden intr exte amot;

%c#4%

```
[imot inte iden intr exte amot];  
imot inte iden intr exte amot;
```

```
! %c#5%  
! [imot inte iden intr exte amot];  
! imot inte iden intr exte amot;
```

```
! %c#6%  
! [imot inte iden intr exte amot];  
! imot inte iden intr exte amot;
```

```
! %c#7%  
! [imot inte iden intr exte amot];  
! imot inte iden intr exte amot;
```

```
! %c#8%  
! [imot inte iden intr exte amot];  
! imot inte iden intr exte amot;
```

```
! Tech11 and Tech14 are requested for aLMR and BLRT.  
OUTPUT: tech11 tech14 svalues;
```

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