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Is there an Internet Addiction and what distinguishes it from problematic Internet use - An attempt to provide working definitions

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Executive summary

Internet is unquestionable one of the greatest achievements over the last years and its use is widespread. Given this widespread use, it comes without any surprise that – as with any other behaviors – some individuals may overuse it or use it in an inadequate or problematic way. Already at least 20 years ago, clinically relevant cases of Internet use became apparent and a term for a new clinical disorder "Internet addiction" emerged.

Since then research on the topic has dramatically increased. However, there seems to exist a multitude of terms used to study the phenomenon. Terms used are ‘‘Internet addiction, ’’Internet dependency", "hyperconnectivity", "cyberaddiction", "virtual addiction", or "compulsive’’, ‘‘problematic’’, "excessive" and ‘‘pathological’’ Internet use.

The inflationary and often interchangeable use of different terms has not helped the field, but blurred two conceptionally different assumptions: Internet use that may result in a clinically independent disorder versus Internet use resulting in consequences without being a disorder. In addition, there is no internationally or even nationally agreed consensus whether an Internet use disorder exists, or whether it is just a maladaptive behavioral pattern, i.e. a problematic use.

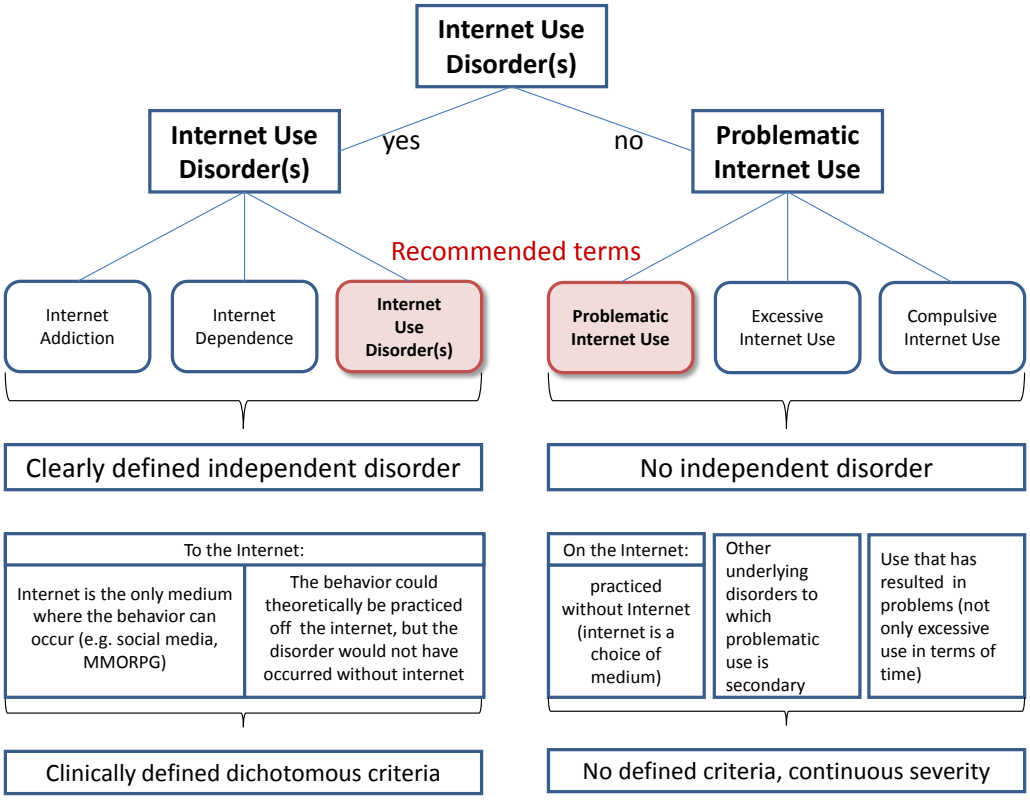
Therefore, the present report was mandated by the Federal Office of Public Health. Its major aim is to come up with two working definitions for Internet addiction on the one hand and problematic Internet use on the other. In addition two further tasks were: a) To review the literature to identify the most common used instrument to assess Internet use disorder (or problematic Internet use), and b) to compare the Compulsive Internet Use Scale (CIUS) and the Internet Addiction Test (IAT) as the most widely used instrument in Switzerland with the other most commonly used instruments as regards their utility in Swiss Health Surveys.

Two distinct concepts

Many studies have indicated that some Internet users show clinically relevant signs of an addiction, supported even by neurobiological research. Nevertheless, it is still a debate whether something like an Internet addiction exists at all, whether there a other underlying disorders (schizophrenic disorders, borderline, mood disorders, or personality disorders) to which "addictive" Internet use is secondary, or whether there are behavioral addictions (sex, gaming, shopping addictions) which would also exist without the Internet and where the Internet is just the preferred medium to meet the demands. In other words: is there an independent clinical diagnosis of Internet addiction (addicted TO the internet), or more general behavioral addictions (or disorders), which are mostly satisfied with the medium Internet (addicted ON the Internet)? Finally, some researchers deny the existence of an Internet addiction, and only assume that there can be problematic Internet use that may lead to consequences.

The present suggestions for working definitions therefore distinguish between an independent clinical disorder, which we call Internet Use disorder (IUD), on the one hand, and problematic Internet use (PIU) on the other. PIU may occur a) alone or be b) a (secondary) part of other mental disorders, or c) may occur because the Internet is the main medium to satisfy a behavioral addiction. Central for PIU, however, is that it results in negative behavioral, psychosocial or physical consequences. PIU should not be used if IUD is diagnosed.

Figure 1 Conceptualization of working definitions of Internet Use Disorder (IUD) and Problematic Internet Use (PIU)



Working definition for Internet use disorder

Currently, gambling disorder (GD) is the only accepted behavioral addiction in the *diagnostic and statistical manual of mental disorders* (DSM-5®). As regards potential Internet disorders, only Internet gaming disorder (IGD) was added to the DSM-5, however not as an accepted disorder but under the category of potential disorders needing further research and clinical experience prior to consideration for inclusion as an official disorder (i.e. placed in the research appendix of DSM-5). Therefore, common definitions of a generalized "Internet addiction" are based on definitions for gambling disorder (or before DSM-5 pathological gambling), the suggested Internet gaming disorder, or adapted criteria for substance use disorders or impulse- control disorder (pathological gambling was defined as an impulse-control disorder in the precursor of DSM-5). Many of these criteria are overlapping.

We identified seven key criteria for the diagnosis of an Internet use disorder (IUD), which led to the following working definition:

Working definition Internet Use Disorder

Internet Use Disorder is an ESSENTIAL persistent and recurrent Internet usage leading to clinically significant impairment or distress, as indicated by the individual with exhibiting four* of the following 7 criteria for an excess of at least 3 months**:

1. **Preoccupation** with the Internet. Preoccupation is a cognitive process to be distinguished from transient enthusiasm while being on the internet. The individual must be thinking about Internet use not only while being on the Internet but also during times of being offline, with excessive thoughts about Internet use occurring throughout the day. For individuals Internet use is central to their lives. They think about previous online activity or anticipate next online session.
2. **Withdrawal,** as manifested by a dysphoric mood, anxiety, irritability, sadness and boredom. Withdrawal symptoms must be distinguished from emotions that arise in response to an external force preventing or stopping an Internet episode. Withdrawal refers to symptoms that arise when one is unable to initiate the use of the Internet for a certain period, and/or when one is purposefully trying to stop Internet use.
3. **Tolerance**, as manifested by a marked increase in Internet use required to achieve satisfaction, or reduced satisfaction when using it the same time.
4. **Impaired control** manifested in unsuccessful attempts to control, cut back or discontinue Internet use with a persistent desire to do so. The criterion also reflects a tendency to relapse.
5. **Continued excessive use of Internet despite knowledge of persistent or recurrent physical, but mostly psychosocial negative consequences (functional impairment).** Consequences should be clinically relevant not only single periods of insufficient sleep or delayed homework. Consequences include
   a) persistent and recurrent neglect of major roles,
   b) clinically significant health effects (e.g. sleeping problems),
   c) jeopardized or lost important relationships,
   d) jeopardized or lost work, educational or career opportunities, including Internet use being a barrier to seek such opportunities.
6. **Loss of interests** in previous hobbies, entertainment as a direct result of, and with the exception of, Internet use leading to deprived social interactions, loneliness and social isolation.
7. Use of the Internet to **escape or relieve** a dysphoric mood (e.g. feelings of helplessness, guilt, anxiety). Internet use to escape adverse moods should be distinguished from use to avoid withdrawal symptoms, because some withdrawal symptoms have overlap with adverse moods. This criterion refers to Internet use in response to feelings of sadness, depression or anxiety that arise from personal situations largely unrelated to Internet use.

Exclusion criterion:
Excessive Internet use which is better accounted for as a secondary symptom of other primary mental disorders
*Currently there is no suggestion for the number of criteria that should be met, we recommend using four
** Three months were suggested by Tao et al. (2010); standard definitions would refer to the occurrence in the past 12 months

Working definition of problematic Internet use

Most researchers in the field agree on two main aspects of problematic Internet use, namely a combination of both cognitive preoccupation (i.e., thoughts about Internet use that are experienced as irresistible) and individual's inability to control their Internet use, which in turn leads to feelings of distress and functional impairment of daily activities.

We suggest the following working definition:

Working definition Problematic Internet Use

1. PIU is a dysfunctional, purposeful and repetitive habit pattern which is expressed by cognitive preoccupation and has resulted in negative, behavioral, psychosocial or physical consequences (e.g. at home, work or school, inhibiting academic performance, damaging health). It may contain aspects of impaired control, tolerance or withdrawal, but central are developed negative consequences.
2. It is a gradual concept with continuously increasing severity (dimensional construct), not a diagnosis with a defined cut-off (dichotomous categorical construct).
3. Underlying other behavioral "addictions" (sex, gaming, shopping), other mental disorders for which the Internet is the choice of the medium or problematic Internet use is a symptom are included, but the diagnosis of Internet Use Disorder is not met.
4. Only nonessential computer/Internet usage (i.e., nonbusiness- or nonacademic-related use) should be evaluated.

Important is that we see PIU as a gradual concept of severity with mild forms but also very severe forms (e.g. with underlying behavioral addictions). Unfortunately, there is no commonly agreed assessment instrument. Therefore there are also no commonly agreed cut-offs for mild, medium or severe PIU.

Instruments in the field

There is an increasing number of instruments to assess problematic Internet use. We compared eight of the most widely used and came up with the following conclusion:

Currently, there are many different instruments measuring "problematic Internet use". Even if the names of the instruments refer to addiction, they actually do not measure all dimensions of a potentially distinct clinical disorder. Most instruments use Likert scales with undefined cut-offs when a criterion (dimension) is met. Thus, they do not allow a diagnosis of an Internet use disorder, where a certain number (e.g. 4 or 5) of criteria must be met. Hence, most instruments measure more or less the severity of problematic Internet use.

We therefore conclude that basically all instruments assess "only" problematic Internet use.

Where should we go?

As regards Internet Use disorder, there is the need to come up with consent whether a generalized Internet use disorder exists or whether there are – if at all – only specific Internet use disorders (Internet gaming disorder, Internet shopping disorder, etc.). As a second step, international working groups such as for DSM-5 must be installed to define the criteria for these disorders (generalized and specific). For assessment instruments using rating scales, a cutoff for each criterion (item) must be set based on psychometrical testing with a clinical gold standard (e.g., on a five point scale from 1 to 5, is the criterion met with a value of 3 or more, 4 or more, or 5?).

As regards the problematic Internet use path (but also for the disorder path), the existence of consequences is an important criterion. Therefore, clear standards need to be defined, when something qualifies as a consequence. For example, is criticism by parents already signaling a "consequence" or just reflects the nagging of an older generation, which had a different socialization into a relatively new medium or a lower competence to use this medium.

For the development and use of assessment instruments a convergence towards a single preferred instrument would be desirable. However, more urgently needed would be psychometrically derived (and clinically validated) score levels indicating different degrees of severity. For example, it still lacks a validation study for e.g. a cut-off of 28 for the CIUS. In addition, more comparative research with the same instrument is needed to see whether "problematic use" has similar meanings in different countries.

Thus, more international convergence in agreed criteria and items is needed to reduce the extreme variability in concepts, dimension and assessment instruments in order to foster internationally comparative research and thus strengthen research finding on what is problematic Internet use. This will help to develop preventive strategies.

Zusammenfassung

Zweifelsfrei ist das Internet eine der grössten Errungenschaften in den letzten Jahren und sein Gebrauch ist weitverbreitet. Bei einer solchen weiten Verbreitung ist es nicht überraschend – wie auch bei anderen Verhaltensweisen – dass einige Personen es übermässig nutzen oder es unangebracht oder problematisch nutzen. Bereits vor mehr als 20 Jahren wurden klinisch relevante Fälle augenscheinlich und der Begriff für eine neue klinische Störung namens "Internetsucht" entstand.

Seit dieser Zeit nahm die Forschung auf diesem Gebiet dramatisch zu, wobei jedoch auch eine Vielzahl unterschiedlicher Begriffe für dieses Phänomen entstanden. Es werden Begriffe verwendet wie ‘‘Internetsucht’’, "Internetabhängigkeit", "Hyperkonnektivität", "Cybersucht", "virtuelle Sucht", bzw. "kompulsiver’’, ‘‘problematischer", "exzessiver" und ‘‘pathologischer’’ Internetgebrauch.

Die inflationäre und häufig austauschbare Verwendung verschiedener Begriffe war dem Forschungsfeld nicht zuträglich, sondern verschleierte zwei konzeptionell unterschiedliche Annahmen: einem Internetgebrauch, der in eine klinisch relevante, unabhängige Störung mündet, bzw. ein Gebrauch, der zu negativen Folgen führt, ohne dass es dabei zu einem klinisch diagnostizierbaren Störungsbild kommt. Darüber hinaus gibt es weder national noch international

einen Konsens darüber, ob es eine Internetgebrauchsstörung überhaupt gibt oder ob es sich dabei um ein unangepasstes Verhalten also einen problematischen Gebrauch handelt.

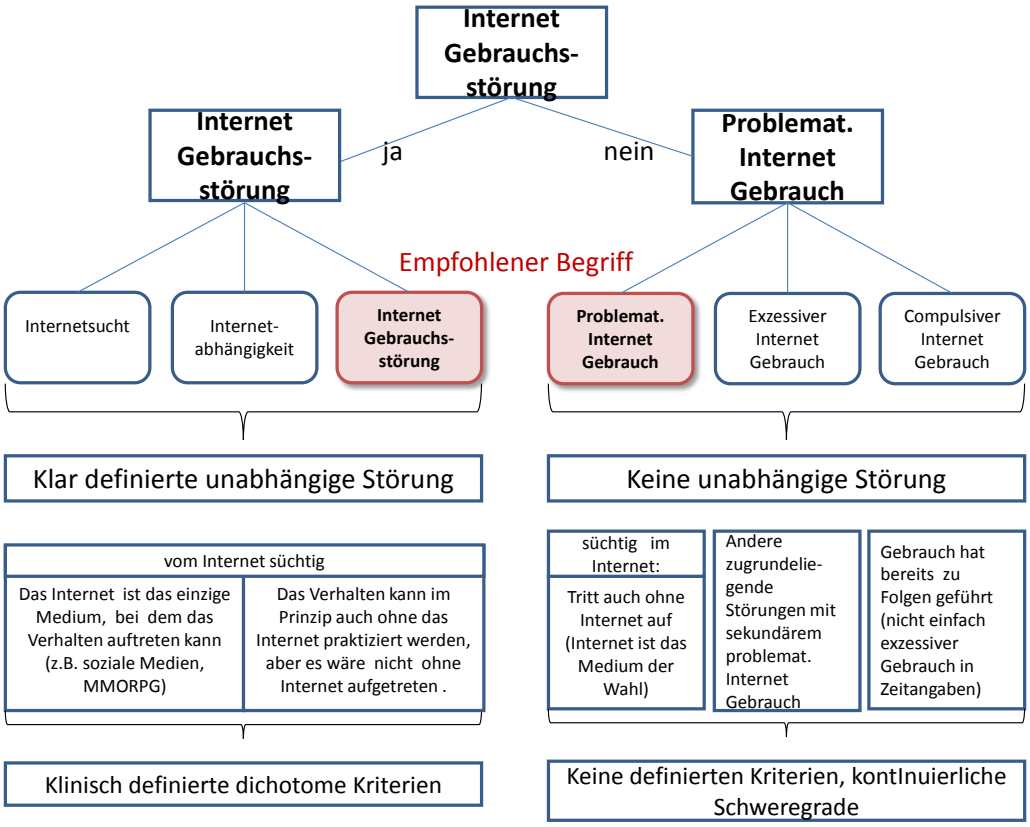
Aus diesem Grund wurde der vorliegende Bericht vom Bundesamt für Gesundheit in Auftrag gegeben. Sein vorrangiges Ziel ist es, Arbeitsdefinitionen von Internetsucht auf der einen Seite und problematischem Internetgebrauch auf der anderen zu erstellen. Zusätzlich sollten a) mit einer Literaturrecherche die bedeutsamsten Instrumente zur Messung von Internetsucht und problematischem Internetgebrauch identifiziert werden sowie b) diese mit der *Compulsive Internet Use Scale* (CIUS) *(Meerkerk et al., 2009)* und dem *Internet Addiction Test* (IAT), den meistgebräuchlichsten Instrumenten in der Schweiz, im Hinblick auf ihre Nutzbarkeit in Gesundheitsbefragungen verglichen werden.

Zwei verschiedene Konzepte

Viele Studien haben gezeigt, dass einige Internetnutzer klinisch relevante Anzeichen einer Sucht aufwiesen. Diese Befunde wurden sogar durch neurobiologische Forschung gestützt. Trotzdem wird weiterhin diskutiert, ob es überhaupt so etwas wie eine Internetsucht gibt oder ob es sich dabei eher um andere Störungen (z.B. schizophrene Störungen, Borderline Störung, affektive Störungen oder Persönlichkeitsstörungen) handelt, bei denen "süchtiger" Internetgebrauch nur ein sekundäres, komorbides Verhalten ist. Drittens wird diskutiert, ob es sich ggf. um andere Verhaltenssüchte (Sexsucht, Kaufsucht, Spielsucht) handelt, die auch ohne Internet vorhanden wären und bei denen das Internet im Wesentlichen nur dasjenige Medium darstellt, mit dem diese Süchte vorrangig bedient werden. Mit anderen Worten stellt sich die Frage, ob es eine klinisch unabhängige Diagnose Internetsucht (vom Internet süchtig) gibt oder es sich eher um allgemeine Verhaltenssüchte (oder Störungen) handelt, die vorrangig durch das Internet bedient werden (süchtig im Internet). Schliesslich gibt es auch Forscher, die generell von keiner Sucht ausgehen, sondern von einem problematischen Internetgebrauch, der zu negativen Folgen führen kann.

Die vorliegenden Vorschläge für Arbeitsdefinitionen unterscheiden deshalb zwischen einer unabhängigen klinischen Diagnose, also einer Störung, die wir Internetgebrauchsstörung nennen, und dem problematischen Internetgebrauch (PIG). Dabei kann PIG alleine auftreten, (sekundärer) Teil von anderen Störungen sein bzw. bei Verhaltenssüchten auftreten, weil das Internet das vorrangige Medium ist, um die Sucht zu befriedigen. Zentral für PIG ist jedoch, dass er zu negativen psychosozialen oder physischen Folgen bzw. Verhaltensauffälligkeiten führt. PIG sollte nur dann verwendet werden, wenn nicht bereits eine Internetgebrauchsstörung diagnostiziert worden ist.

Abbildung 1. Konzeptualisierung der Arbeitsdefinitionen für Internetgebrauchsstörung und problematischem Internetgebrauch



Arbeitsdefinition für die Internetgebrauchsstörung

Im Moment ist das pathologische Glücksspiel (gambling disorder) die einzige anerkannte Verhaltenssucht im *diagnostic and statistical manual of mental disorders* (DSM-5®). Im Hinblick auf potenzielle Internetgebrauchsstörungen wurde nur die Internetspielsucht (Internet gaming disorder) dem DSM-5 hinzugefügt. Dies jedoch nicht als eine akzeptierte Störung, sondern nur in der Kategorie potenziell möglicher Störungen, die weiterer Forschung und klinischer Erfahrung bedürfen, bevor sie als offizielle Störung in Betracht gezogen werden kann (d.h., sie befindet sich im Forschungsanhang des DSM-5). Aus diesem Grund werden bestehende Definitionen der Internetgebrauchsstörung meist auf Definitionen für pathologisches Glücksspiel, dem Vorschlag für die Internetspielsucht oder adaptierten Kriterien für Substanzgebrauchsstörungen oder Impulskontrollstörungen (pathologisches Glücksspiel war vor dem DSM-5 unter den Impulskontrollstörungen eingeordnet) aufgebaut. Viele dieser Definitionen haben überlappende Kriterien.

Wir haben sieben Schlüsselkriterien für die Diagnose einer Internetgebrauchsstörung identifiziert, die letztendlich zu folgender Arbeitsdefinition geführt haben:

Arbeitsdefinition für die Internetgebrauchsstörung

Die Internetgebrauchsstörung ist ein essentiell anhaltender und wiederkehrender Internetgebrauch, der zu klinisch bedeutsamen Beeinträchtigungen und Stress führt. Die Störung ist zu diagnostizieren, wenn vier* oder mehr der folgenden Kriterien über einen Zeitraum von mindestens 3 Monaten** vorliegen**:

1. **Vertieftsein** im Internet. Vertieftsein ist ein kognitiver Prozess, der unterschieden werden muss von vorrübergehendem Enthusiasmus, während man im Internet ist. Das Individuum muss nicht nur über das Internet nachdenken, wenn es online ist, sondern auch zu offline Zeiten. Dabei tritt exzessives Nachdenken über das Internet den ganzen Tag hinweg auf. Das Internet wird ein zentraler Aspekt im Leben dieser Personen. Sie denken über frühere Online-Aktivitäten nach oder antizipieren bereits nächste Online-Sitzungen.
2. **Entzugserscheinungen.** Entzugserscheinungen äussern sich über Dysphorie, Ängstlichkeit, Irritabilität, Traurigkeit und Langeweile. Entzugserscheinungen müssen unterschieden werden von Emotionen, die entstehen, wenn man von aussen gezwungen wird, nicht ins Internet zu gehen oder eine Internetsitzung zu beenden. Entzugserscheinungen beziehen sich auf Symptome, die entstehen, wenn jemand über einen gewissen Zeitraum nicht ins Internet gehen kann und/oder wenn zielgerichtet versucht wird, den Internetgebrauch zu stoppen.
3. **Toleranz** manifestiert sich als ein deutlicher Anstieg des Internetgebrauchs. Dieser ist notwendig geworden um Genugtuung zu erreichen. Es kann auch bedeuten dass die ursprüngliche Genugtuung reduziert ist, obwohl man ebenso lange wie früher im Internet ist.
4. **Beeinträchtigte Kontrolle** zeigt sich in erfolglosen Versuchen den Internetgebrauch zu kontrollieren, zu reduzieren oder auszusetzen, wobei ein starker und dauerhafter Wunsch besteht dies zu tun. Dieses Kriterium beinhaltet auch die Tendenz zu Rückfällen.
5. **Fortgesetzter exzessiver Internetgebrauch trotz des Wissens um wiederkehrende oder fortbestehende physische und psychosoziale Folgen (funktionale Beeinträchtigung).** Folgen sollten klinisch relevant sein und nicht nur vereinzelte Phasen mit unzureichendem Schlaf oder verspäteter Erledigung der Hausarbeit darstellen.
   a) anhaltender und wiederkehrende Vernachlässigung von bedeutsamen Rollen
   b) klinisch relevante Gesundheitsbeeinträchtigungen (z.B. Schlafprobleme)
   c) Gefährdung oder Verlust von wichtigen zwischenmenschlichen Beziehungen
   d) Gefährdung oder Verlust des Arbeitsplatzes, Ausbildungs- oder Karriereentwicklungen, einschliesslich der Tatsache, dass der Internetgebrauch eine Barriere darstellte, solche Entwicklungsmöglichkeiten zu suchen.
6. **Verlust des Interesses** an vormaligen Hobbies oder Vergnügungen(mit Ausnahme des Internetgebrauchs) als direkte Folge des Internetgebrauchs. Dies führt zu eingeschränkten sozialen Interaktionen, Einsamkeit und sozialer Isolation.
7. **Internetgebrauch als Flucht vor oder Erleichterung** von Dysphorie (z.B. Gefühlen von Hilflosigkeit, Schuld oder Angst). Der Internetgebrauch um einer negativen Stimmungslage zu entfliehen sollte von Entzugserscheinungen unterschieden werden, da diese häufig sich ebenfalls in negativen Stimmungen ausdrücken. Das Kriterium bezieht sich auf den Internetgebrauch als Reaktion auf Traurigkeit, depressiver Stimmung oder Ängstlichkeit, die durch persönliche Umstände entstehen, die weitestgehend nicht in Zusammenhang mit dem Internet stehen.

Ausschlusskriterium:
Exzessiver Internetgebrauch, der eher ein sekundäres Symptom anderer mentaler Störungen ist.
*Momentan gibt es noch keinen einheitlich akzeptierten Cut-off für die Anzahl Kriterien, die erfüllt sein müssen. Wir schlagen vier oder mehr Kriterien vor.
** Drei Monate wurden von Tao et al. (2010) vorgeschlagen; andere Standarddefinitionen beziehen sich auf das Auftreten in den letzten 12 Monaten.

Arbeitsdefinition für problematischen Internetgebrauch

Die meisten Forschenden im Feld stimmen überein, dass es zwei Hauptaspekte des problematischen Internetgebrauchs gibt, nämlich eine Kombination aus Vertieftsein (also Gedanken ans Internet, die als unwiderstehlich wahrgenommen werden) und die Unfähigkeit der Nutzenden, den Internetgebrauch zu kontrollieren. Dies führt zu Stress und funktionalen Beeinträchtigungen im Alltagsleben.

Wir schlagen folgende Arbeitsdefinition vor:

Arbeitsdefinition des problematischen Internetgebrauchs (PIG)

1. PIG ist ein dysfunktionales, zielgerichtetes und wiederholtes Verhaltensmuster, das sich durch kognitives Vertieftsein ausdrückt und in negative Folgen (z.B. im Haus, auf Arbeit oder in der Schule, Beeinträchtigung akademischer Leistungen, Gesundheitsbeeinträchtigungen) mündet. Dieses Verhaltensmuster mag Aspekte von Kontrollverlust, Toleranz und Entzugserscheinungen beinhalten, aber zentral in diesem Konzept ist die Entwicklung negativer Folgen.
2. PIG ist ein graduelles Konzept mit kontinuierlich ansteigendem Schwergrad (dimensionales Konstrukt) und keine Diagnose mit einem definierten Cut-off (kategoriales dichotomes Konstrukt).
3. Unter PIG fallen auch andere Verhaltenssüchte (Sex-, Spiel, Kaufsucht) bzw. andere mentale Störungen, wenn das Internet das Medium der Wahl darstellt oder für die PIG ein gravierendes Symptom ist. Ausgeschlossen ist eine vorliegende Diagnose der Internetgebrauchsstörung.
4. Nur nicht notwendiger Internetgebrauch (z.B. nicht auf die Arbeit oder das Studium bezogener Internetgebrauch) sollte evaluiert werden.

Wichtig ist, dass wir PIG als graduelles Konzept mit zunehmendem Schweregrad sehen, d.h., es gibt milde, mittlere und schwere Formen (z.B. bei zugrundeliegenden anderen Verhaltenssüchten) von PIG. Leider gibt es zur Zeit kein einheitlich anerkanntes Beurteilungsinstrument. Damit gibt es auch keine allgemein akzeptierten Cut-offs für milde, mittlere und schwere Formen.

Messinstrumente

Es gibt eine steigende Anzahl von Instrumenten, um problematischen Internetgebrauch zu messen. Wir haben acht der meistgebräuchlichsten Instrumente untersucht und kamen zu diesen Schlussfolgerungen:

Augenblicklich gibt es eine Vielzahl von Instrumenten zur Messung des problematischen Internetgebrauchs. Selbst wenn die Instrumente im Namen auf "Sucht" hinweisen, so misst keines alle Dimensionen einer abgrenzbaren klinischen Diagnose. Die meisten Instrumente verwenden Likertskalen ohne Angaben, bei welchem Wert der Skalenankreuzung ein Kriterium (Dimension) erfüllt ist oder nicht. Deshalb erlauben diese Instrumente auch nicht, eine Anzahl von erfüllten Kriterien (z.B. 4 oder 5) zu bestimmen. Das bedeutet, dass praktisch alle Instrumente mehr oder weniger nur den Schweregrad problematischen Internetgebrauchs messen. Wir schlussfolgern deshalb, dass praktisch alle Instrumente "nur" problematischen Internetgebrauch messen.

Wohin führt der Weg?

Im Hinblick auf eine Internetgebrauchsstörung braucht es einen Konsens, ob es eine generelle Internetgebrauchsstörung gibt oder – wenn überhaupt – nur spezifische Gebrauchsstörungen (z.B. Internet-Spielstörung, Internet-Kaufstörung etc.). In einem zweiten Schritt sollte eine internationale Arbeitsgruppe, ähnlich wie beim DSM-5, installiert werden, um die Kriterien für eine generelle oder für spezifische Internetgebrauchsstörungen zu definieren. Bei Messinstrumenten, die Ratingskalen verwenden, muss für jedes Kriterium (Item) psychometrisch unter Verwendung eines Goldstandrads festgelegt werden, bei welchem Skalenwert das jeweilige Kriterium erfüllt ist (z.B. ist auf einem fünfstufigen Likert-Item ein Kriterium erfüllt, wenn der angekreuzte Wert 3 oder grösser, 4 oder grösser etc. ist?).

Im Hinblick auf den problematischen Internetgebrauch (dies gilt jedoch auch für die Diagnose der Internetgebrauchsstörung) ist das Auftreten von negativen Folgen ein bedeutsames Kriterium. Deshalb müssen klare Standards definiert werden, ab wann etwas als das "Auftreten einer Folge" definiert ist. Ist beispielsweise die Kritik von Eltern am Internetgebrauch ihrer Kindern bereits eine "Folge" des problematischen Gebrauchs oder stellt es nur das "Nörgeln" einer älteren Generation dar, die eine andere Sozialisation in den Gebrauch eines neuen Mediums hatte bzw. eine geringere Kompetenz bei der Nutzung des Mediums aufweist.

Bei der Entwicklung und Anwendung von Messinstrumenten wäre eine Konvergenz zu einem einzigen, bevorzugten Instrument wünschenswert. Dringlicher aber sind psychometrisch ermittelte und klinisch getestet Skalenwerte, die verschiedene Schweregrade anzeigen. Beispielsweise fehlt immer noch eine Validierung für einen Grenzwert von 28 beim CIUS. Zusätzlich sind mehr vergleichende Studien unter Verwendung eines einheitlichen Instrumentes nötig, um zu wissen, ob "problematischer Internetgebrauch" eine vergleichbare Bedeutung in verschiedenen Ländern hat.

Zusammenfassend benötigt es mehr internationale Konvergenz hin zu einheitlich akzeptierten Kriterien (und anschliessend Items und Instrumente, diese zu messen), um die extreme Vielfalt in Konzepten, Dimensionen und Messinstrumenten zu reduzieren. Dies würde vergleichende internationale Studien fördern und somit zu stärkeren Forschungsergebnissen darüber führen, was problematischer Internetgebrauch wirklich ist. Darauf aufbauend könnten dann sinnvolle Präventionsstrategien entwickelt werden.

Résumé

Internet est sans aucun doute l'une des plus grandes réalisations de ces dernières années et son utilisation est largement répandue. De par son utilisation largement répandue, c'est sans surprise que – comme tout autre comportement – certains individus peuvent l'utiliser avec excès, de manière inadéquate ou problématique. Il y a plus de vingt ans déjà que des cas cliniques pertinents d'utilisation d'internet sont apparus, ainsi qu'un terme pour désigner un nouveau trouble clinique: "addiction à Internet".

L'utilisation croissante et souvent interchangeable des différents termes n'a pas aidé le champ de recherche, mais à flouté deux hypothèses conceptuellement différentes: l'utilisation d'Internet peut conduire à un trouble clinique indépendant versus l'utilisation d'Internet peut avoir des conséquences négatives sans être un trouble. En sus, il n'y a pas de consensus international ou même national sur l'existence ou non d'un trouble d'utilisation d'Internet, ou même si ce serait plutôt un pattern de comportements inadaptés, c.-à-d. une utilisation problématique.

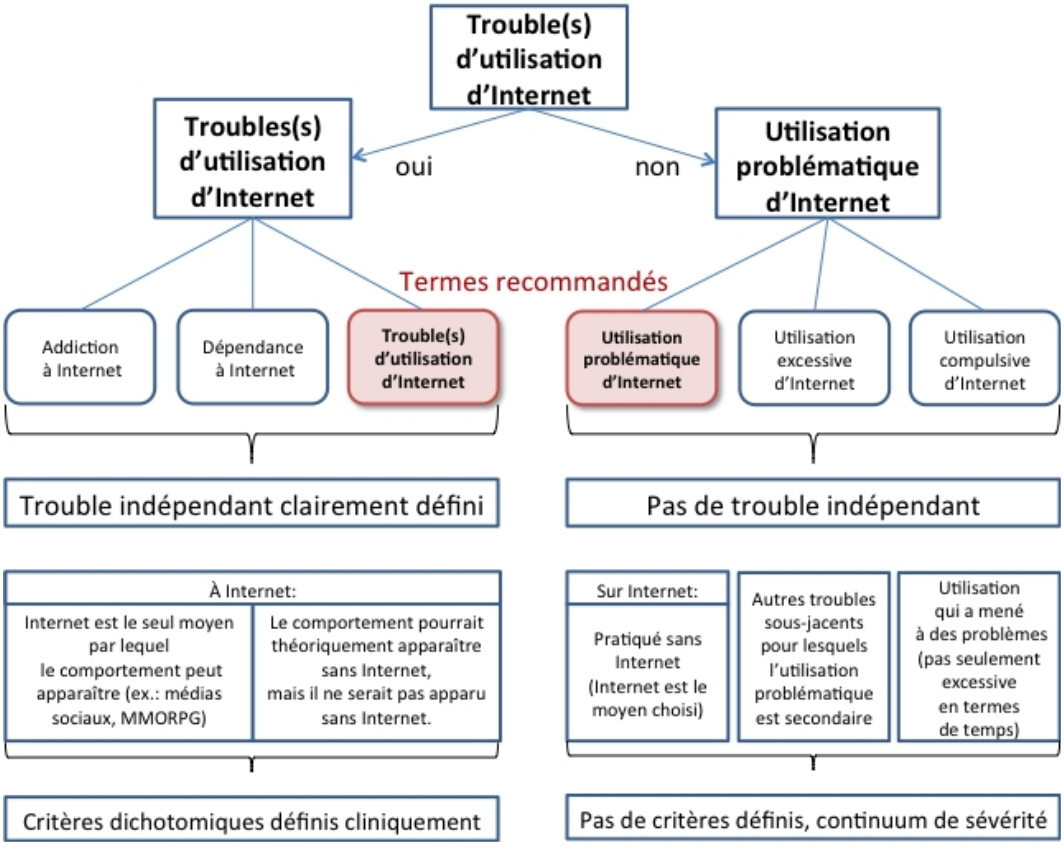
Pour cette raison, le présent rapport a été mandaté par l'Office fédéral de la Santé Publique. Son objectif principal est d'arriver avec deux définitions pratiques de l'addiction à Internet d'une part, et de l'utilisation problématique d'Internet d'autre part. En plus, deux autres tâches étaient: a) une revue de littérature afin d'identifier l'outil d'évaluation du trouble d'utilisation d'Internet (ou utilisation problématique d'Internet) le plus utilisé, et b) de comparer la *Compulsive Internet Use Scale* (CIUS) et l'*Internet Addiction Test* (IAT), les instruments les plus utilisés en Suisse, à d'autres instruments en fonction de leur utilité pour les questionnaires suisses de santé.

Deux concepts distincts

Plusieurs études ont indiqué que certains utilisateurs d'Internet montraient des signes cliniques pertinents d'une addiction, même soutenues par des recherches neurobiologiques. Néanmoins, il y a toujours débat pour savoir s'il existe quelque chose comme une addiction à Internet ou s'il y aurait d'autres troubles sous-jacents (schizophrénie, troubles de la personnalité borderline, de l'humeur ou de la personnalité) auxquels l'utilisation "addictive" d'Internet serait secondaire, voire même s'il y a des comportements addictifs (addiction au sexe, au jeu, au shopping) qui pourraient aussi exister sans Internet et où Internet n'est qu'un moyen privilégié pour répondre à ces demandes. En d'autres termes, y a-t-il un diagnostic clinique indépendant de l'addiction à Internet (addicte À Internet), ou des comportements addictifs plus généraux (ou troubles), qui sont principalement satisfaits à l'aide d'Internet comme un moyen (addicte SUR Internet)? Pour finir, certains chercheurs nient l'existence d'une addiction à Internet et affirment seulement qu'il pourrait y avoir une utilisation problématique d'Internet pouvant mener à des conséquences négatives.

Les présentes suggestions de définitions pratiques distinguent ainsi un trouble clinique indépendant, que l'on pourrait appeler trouble d'utilisation d'Internet (Internet Use Disorder, IUD), d'une part, et une utilisation problématique d'Internet (Problematic Internet Use, PIU) d'autre part. PIU pourrait apparaître a) seul ou b) être une part (secondaire) d'un autre trouble mental, ou c) pourrait apparaître car Internet est le moyen principal pour satisfaire une addiction comportementale. Cependant, il est essentiel pour PIU qu'il conduise à des conséquences négatives comportementales, psychosociales ou physiques. PIU ne devrait pas être utilisé lorsque IUD est diagnostiqué.

Figure 1 : Conceptualisation des définitions pratiques du trouble d'utilisation d'Internet (IUD) et de l'utilisation problématique d'Internet (PIU)



Définition pratique du trouble de l'utilisation d'Internet

Actuellement, le jeu pathologique (Gambling Disorder, GD) est la seule addiction comportementale acceptée selon le manuel diagnostique des troubles mentaux (DSM-5®). Concernant un trouble d'Internet potentiel, seul le trouble du jeu en ligne (Internet Gaming Disorder, IGD) a été ajouté au DSM-5, cependant pas accepté en tant que trouble mais sous la catégorie des troubles potentiels qui demandent plus de recherche et d'expérience clinique (c.-à-d. placés sous l'appendix de recherche du DSM-5) avant d'envisager de les inclure comme des troubles officiels. Ainsi, les définitions courantes d'une "addiction à Internet" générale sont basées sur les définitions du jeu pathologique, du trouble proposé du jeu en ligne, ou d'une adapation des critères issus des troubles d'utilisation de substances ou trouble du contrôle des impulsions (le jeu pathologique était classé comme un trouble du contrôle des impulsions dans les versions précédant le DSM-5). Beaucoup de ces définitions ont des critères qui se chevauchent.

Nous avons identifié sept critères clés pour le diagnostic du trouble d'utilisation d'Internet (Internet Use Disorder), qui mènent à la définition pratique suivante:

Définition pratique du trouble d'utilisation d'Internet

Le trouble d'utilisation d'Internet est une utilisation d'Internet ESSENTIELLE, persistante et récurrente qui mène à un dysfonctionnement et une détresse cliniquement significatives. Le trouble est diagnostiqué lorsque au moins quatre* des 7 critères suivants sont exprimés pendant au moins 3 mois**:

1. **Préoccupation** en lien avec Internet. La préoccupation est un processus cognitif distinct d'un enthousiasme transitoire lorsqu'étant sur Internet. L'individu doit penser à utiliser Internet pas seulement en naviguant sur celui-ci, mais aussi lorsqu'il est hors ligne, avec des pensées excessives à propos de l'utilisation d'Internet apparaissant tout au long de la journée. Pour les individus, l'utilisation d'Internet est centrale dans leur vie. Ils pensent à leurs activités en ligne passées ou ils anticipent leur prochaine session en ligne.
2. **Retrait**, tel que manifesté par une humeur dysphorique, de l'anxiété, de l'irritabilité, de la tristesse et de l'ennui. Les symptômes du retrait doivent être distincts des émotions qui surviennent en réponse à une intervention externe qui prévient ou stoppe un épisode d'utilisation d'Internet. Le retrait fait référence aux symptômes qui se manifestent quand on n'est pas capable d'initier une utilisation d'Internet pendant un certain temps et/ou quand on essaie à dessein de stopper l'utilisation d'Internet.
3. **Tolérance**, telle que manifestée par une augmentation marquée de l'utilisation d'Internet requise pour atteindre une satisfaction ou une satisfaction réduite alors qu'on l'utilise aussi longtemps qu'avant.
4. **Contôle altéré**, manifesté par une tentative de contrôle non réussie, une utilisation d'Internet réduite ou discontinue avec un désir persistant de le faire. Le critère reflète aussi une tendance à la rechute.
5. **Continuer à utiliser Internet de manière excessive malgré avoir connaissance de conséquences négatives physiques, mais surtout psychosociales, persistantes ou récurrentes (dysfonctionnement).** Les conséquences doivent être cliniquement pertinentes et non pas seulement des périodes isolées de manque de sommeil ou des tâches reportées. Les conséquences incluent
   a) une négligence persistante et récurrente des rôles sociaux majeurs,
   b) des effets sur la santé cliniquement significatifs (par exemple des problèmes de sommeil),
   c) des relations importantes compromises ou perdues,
   d) des opportunités de travail, d'éducation ou de carrière compromises ou perdues, en incluant l'utilisation d'Internet comme une barrière pour saisir de telles opportunités.
6. **Perte d'intérêt dans des hobbies, loisirs ou amusements précédents** (à l'exception d'Internet), comme résultants directement de l'utilisation d'Internet menant à des interactions sociales réduites, la solitude et un isolement social.
7. **Utilisation d'Internet pour échapper ou soulager une humeur dysphorique** (c.-à-d. sentiments d'impuissance, de culpabilité, d'anxiété). L'utilisation d'Internet pour échapper à des humeurs indésirables doit être dinstinguée de son utilisation pour éviter des symptômes de retrait, car certains symptômes de retrait chevauchent une humeur indésirable. Ce critère fait référence à l'utilisation d'Internet en réponse à des sentiments de tristesse, de dépression ou d'anxiété qui peuvent apparaître dans des situations personnelles non reliées à l'utilisation d'Internet.

Critères d'exclusion:
Utilisation excessive d'Internet qui est plutôt comptabilisée comme un symptôme secondaire d'autres troubles mentaux premiers.
*Actuellement, il n'y a pas de suggestion pour le nombre de critères qui devraient être remplis, nous recommandons d'en utiliser quatre.
** Trois mois étaient suggérés par Tao et al. (2012) ; les définitions standards préconisent une occurrence durant les 12 derniers mois.

Définition pratique de l'utilisation problématique d'Internet

La plupart des chercheurs dans le domaine s'accordent sur deux aspects de l'utilisation problématique d'Internet, à savoir la combinaison des préoccupations cognitives (c.-à-d., pensées au sujet de l'utilisation d'Internet qui sont vécues comme irrésistibles) et les incapacités individuelles à contrôler l'utilisation d'Internet, qui mènent à des sentiments de désespoir et à un handicap fonctionnel dans les activités quotidiennes.

Nous suggérons la définition pratique suivante:

Définition pratique de l'utilisation problématique d'Internet

1. PIU est un pattern d'habitudes dysfonctionnel, volontaire et répétitif, qui est exprimé par une préoccupation cognitive résultant en des conséquences comportementales, psychosociales ou physiques négatives (exemple, à la maison, au travail ou à l'école, inhibition des performances académiques, dommageable pour la santé). Il peut contenir des aspects de perte de contrôle, de tolérance ou de retrait, mais les conséquences négatives restent centrales.
2. C'est un concept graduel avec une sévérité augmentant continuellement (construct dimensionnel), et non pas un diagnostic avec un cadre défini (construct catégorique dichotomique).
3. Sous-jacent à d'autres addictions comportementales (sexe, jeu, shopping) ou d'autres troubles pour lesquels Internet est le moyen choisi ou un symptôme aggravant, mais le diagnostic du trouble d'utilisation d'Internet n'est pas posé.
4. Seulement les utilisations d'Internet/d'ordinateur non essentielles (c.-à-d., pas reliées au travail ou aux études) devraient être évaluées.

Il est important de considérer PIU comme un concept de sévérité graduel avec des formes douces mais aussi des formes très sévères (par exemple, avec des addictions comportementales sous-jacentes). Malheureusement, il n'y a pas de d'instrument d'évaluation consensuel. Ainsi, il n'y a pas non plus de délimitation consensuelle pour les formes de PIU douce, moyenne ou sévère.

Instruments dans le champ d'application

Il y a un nombre croissant d'instruments d'évaluation de l'utilisation problématique d'Internet. Nous avons comparé les huit les plus largement utilisés et sommes arrivés à la conclusion suivante:

Actuellement, il existe plusieurs instruments différents pour mesurer "l'utilisation problématique d'Internet". Même si le nom des instruments fait référence à une addiction, ces derniers ne mesurent pas toutes les dimensions d'un trouble clinique distinct potentiel. La plupart des instruments utilisent une échelle de Likert sans seuils définis pour savoir si un critère (une dimension) est rempli. Ainsi, ils ne permettent pas le diagnostic d'un trouble d'utilisation d'Internet pour lequel un certain nombre de critères doivent être remplis (4 ou 5). Par conséquent, la plupart des instruments mesurent plus ou moins la sévérité de l'utilisation problématique d'Internet.

Nous concluons ainsi que tous les instruments mesurent "seulement" l'utilisation problématique d'Internet.

Où devrions-nous aller ?

Concernant un trouble d'utilisation d'Internet, il n'y a pas besoin d'arriver à un consensus soit sur l'existence d'un trouble général d'utilisation d'Internet, soit s'il y a seulement des troubles d'utilisation d'Internet spécifiques (trouble du jeu en ligne, trouble du shopping en ligne, etc.) Dans un deuxième temps, les groupes de travail internationaux, comme ceux pour le DSM-5, doivent s'accorder pour définir les critères de ces deux troubles (général ou spécifique). Pour les instruments d'évaluation utilisant des échelles de mesure, un seuil bien défini pour chaque critère (item) doit être posé sur la base de tests psychométriques aux standards cliniques (par exemple sur une échelle de Likert à 5 points, est-ce que le critère est rempli avec une valeur de 3 ou plus, de 4 ou plus, ou de 5?).

Sur la piste d'une utilisation problématique d'Internet (mais aussi d'un trouble), l'apparition de conséquences négatives est un critère important. Ainsi, des standards clairs doivent être définis pour savoir ce qui peut être qualifié de conséquences négatives. Par exemple, est-ce que les critiques des parents signalent déjà une "conséquence négative" ou représentent simplement une réprobation d'une génération plus ancienne, qui se socialise autrement par rapport à un relativement nouveau moyen ou des compétences moindres pour utiliser celui-ci.

Pour le développement et l'utilisation d'instruments d'évaluation, un consensus sur un unique instrument privilégié serait souhaitable. Cependant, des seuils dérivés de la psychométrie (et validés cliniquement) indiquant différents degrés de sévérité sont en priorité nécessaires. Par exemple, il manque une étude de validation pour un seuil de 28 pour le CIUS. De plus, plusieurs recherches comparatives avec des instruments similaires sont nécessaires pour voir si "l'utilisation problématique" a des significations identiques dans les différents pays.

Ainsi, un consensus international sur les critères et items est nécessaire pour réduire la variabilité extrême dans les concepts, les dimensions et les instruments d'évaluation. Cela favoriserait une recherche comparative internationale et renforcerait ainsi les résultats de recherche sur ce qu'est une utilisation problématique d'Internet. Cela aiderait à développer des stratégies préventives.

1. Introduction

Internet is unquestionable one of the greatest achievements over the last years and its use is widespread, particularly in established market economies. For example, in Switzerland according to the JAMES study 2016 (Waller et al., 2016) among adolescents (12-19 years old) 99% of the households have at least one computer or laptop, 97% have Internet access, and 98% of these adolescents even own a smartphone. Of the total population aged 15 and above, 84% use the Internet privately, and among those aged 15-34 the prevalence exceeded 98% (Marmet et al., 2015). Given this widespread use, it comes without any surprise that – as with any other behaviors – some individuals may overuse it or use it in an inadequate or problematic way. Already at least 20 years ago, clinically relevant cases of Internet use became apparent and a term for a new clinical disorder "Internet addiction" emerged (Griffiths, 1996a; Young, 1996). This was operationalized in diagnostic questionnaires such as the Internet Addiction Diagnostic Questionnaire (IADQ) (Young, 1998b).

Since then research on the topic has dramatically increased, and with this increase a multitude of terms used to study the phenomenon has appeared. Terms used are ‘‘Internet addiction, ’’Internet dependency", "hyperconnectivity", "cyberaddiction", "virtual addiction", or "compulsive’’, ‘‘problematic’’, "excessive" and ‘‘pathological’’ Internet use (Breslau et al., 2015; De Cock et al., 2014; Kuss et al., 2014a; Richter et al., 2016).

The reasons for this clutter are, among others, that there is no internationally agreed definition of these different terms (Tokunaga & Rains, 2016). There is also no agreement, whether there is an independent pathology (and not only a comorbid behavior of other pathologies) justifying terms such as Internet addiction or Internet use disorder (Breslau et al., 2015; Weinstein & Lejoyeux, 2010). Currently, gambling disorder (GD) is the only accepted behavioral addiction (Bélanger-Lejars, 2015) in the *diagnostic and statistical manual of mental disorders* (DSM-5®) (American Psychiatric Association (APA), 2013). As regards potential Internet disorders, only Internet gaming disorder (IGD) was added to the DSM-5, however not as an accepted disorder but under the category of potential disorders needing further research and clinical experience prior to consideration for inclusion as an official disorder (i.e. placed in the research appendix of DSM-5). Even for Internet gaming, the likely most researched aspect of a potential Internet addiction, the field is far from reaching a consensus. Petry and colleagues (2014) recently published a consensus paper on IGD of an international research group, which was promptly counter argued by another international group of experts (Griffiths et al., 2016).

As a result, different terms of "Internet addiction" are commonly used interchangeably and reviews cautiously define its own preferred term. For example, a recent report of the RAND cooperation (Breslau et al., 2015) favored the term “Problematic Internet Use” (PIU) because it makes fewer assumptions about the underlying pathology. Note, that some people have used "PIU" for pathological Internet Use. We will use the abbreviation "PIU" exclusively for problematic Internet use. In a recent memorandum of the German Society for Addiction Research and Addiction Therapy (Rumpf et al., 2016) the term – literally - Internet dependence (Internetabhängigkeit) was used. The authors justified their term, because they felt that there is no consistent notation of the "disorder" and Internet dependence appeared to be the most often used term. It should be noted that very likely not Internet dependence was meant but Internet addiction; however, there is no agreed German translation of addiction (Sucht, Abhängigkeit). Similar discussions can be found in the international literature (Yellowlees & Marks, 2007). It is important to note that the interchangeable use of dependence and addiction has created confusion. The term “dependence” has traditionally

been used to describe “physical dependence”, which refers to the adaptations that result in withdrawal symptoms when drugs, such as alcohol and heroin, are discontinued. The adaptations associated with drug withdrawal can be completely different from the addiction, which refers to the loss of control to take the drug even at the expense of adverse consequences (O'Brien et al., 2006). It is possible to be dependent on a substance, without being addicted to the substance. For example, people being correctly treated with morphine because of chronic pain associated with terminal cancer may be dependent (they suffer withdrawal syndrome when medication is stopped). They are, however not compulsive users of the morphine, and thus they are not addicted. Similarly people may be addicted but not physically dependent.

Even more complex is the measurement of the underlying construct, whatever it is called. For example, Laconi and colleagues (2014) identified forty-five tools for the assessment of Internet addiction. Similarly, other reviews of assessment instruments of "problematic Internet use" (Aboujaoude, 2010), or "Internet addiction" (Kuss et al., 2014a; Lortie & Guitton, 2013) were conducted. Many of these instrument have some overlaps in items, even if the wording may not be identical (King et al., 2013), but also measure specific aspects of "problematic Internet use " or "Internet addiction".

The present report has three major aims:

- To review the existing literature in order to identify concepts (theoretical background) and corresponding sub-dimensions of concepts (tolerance, negative outcomes, etc.) which are necessary for the assessment of an Internet disorder in a clinical sense, or of problematic Internet use, if there is no assumption of a clinical independent diagnosis. The secondary aim is to suggest working definitions of Internet Use Disorder (or Internet Addiction, for several reasons we avoid the term Internet Dependence, see below) versus problematic Internet use (or similar wordings). Note, that we are well aware that this cannot be a consensus definition, given the large disagreement in the existing literature. However, we hope that dichotomizing working definitions may be useful to distinguish between assessment of a disorder versus assessment of a problematic use behavior without being an independent disorder.
- To review the literature to identify the most common used instrument to assess Internet use disorder (or problematic Internet use). This will be done to compare items and dimensions of these questionnaires to come up with a recommendation which of these instruments can actually be used to assess Internet Use disorder (or problematic use).
- To compare the Compulsive Internet Use Scale (CIUS) (Meerkerk et al., 2009) and the Internet Addiction Test (IAT) (Young, 1998a) as the most widely used instrument in Switzerland with the other most commonly used instruments.

We will not discuss age-specific definitions of Internet addiction or problematic Internet use, even though such behaviors are commonly most prevalent in young people. However, we will discuss that some criteria of problematic Internet use may be heavily influenced by age effects, e.g. by a 'moral panic' of older people or parents towards a new medium, which typically center on children and young people (Livingstone & Bovill, 1999). For example, the deception of its own Internet use behavior may often be a mean of children to hide the use towards "overly" controlling parents, and emotional reactions of children, when parents interdict Internet use should not be interpreted as "withdrawal" symptoms (Batra et al., 2014).

2. What would be Internet Addiction, if there is such a pathology, and how does it compare with problematic Internet use?

The advancement of the Internet in everyday life has been accompanied by an exploding amount of research studies on its effects. However, the Internet is not the first medium that was studied from a view point of "addiction". Research on being addicted to media has started in the 1940ies and the first medium that was put into question was the radio (Rowland, 1944). After studies on radio addiction, the next medium under attack was the television. TV viewing was recognized as a potential "addiction" which needed more attention (Winn, 1977). As stated by Tokunaga (2015), the interest for media addiction increased with the observation of young people "developing habitual media consumption practices, interpreted then as addiction, to radio programs and movie films" (p.133). Following studies on TV viewing, the next round was on the effects of video gaming (Fisher, 1994), and it needed only little additional time to arrive studying Internet addiction (Young, 1996).

Preston (1941, cit. by Tokunaga, 2015) was among the first to describe media addiction as "giving oneself over to a habit forming practice very difficult to overcome, no matter how the aftereffects are dreaded". TV addiction has been conceptualized as a multidimensional phenomenon consisting of three key elements (dimensions): a) *loss of control* that results in too much time spent in front of the TV, b) *unsuccessful attempts to reduce its use*, and c) *functional impairment* such as professional and social problems (Kubey, 1990). Video game addiction was similarly described as excessive time spent to play, neglecting important things, and being aware of a video game problem but having little capacity to regain control (Fisher, 1994). Many of these criteria/dimensions are nowadays discussed with regard to Internet Addiction or other behavioral addictions like gambling disorder.

From today's perspective "radio addiction" or "TV addiction" may sound somewhat ridiculous, but it appeared as a major problem at the time as the media put their foot in the door of society. Thus, a first question to ask is whether there exists something like an Internet addiction or whether we are faced at a moral panic of an emerging new media phenomenon. As stated by Marsh and Melville (2011) a moral panic refers to an exaggerated reaction, from the media, the police or wider public to the activities of particular social groups. In a media use perspective, the introduction of each new medium has generally been accompanied by a 'moral panic', anxieties typically center on children and young people, and each new panic displaces earlier panics, thereby facilitating acceptance of earlier 'new' media (Livingstone & Bovill, 1999).

For other authors Internet use has just become part of everyday live. For example, social media have become a way of life for many individuals, increasing to an extreme the communication between individuals (Brooks & Longstreet, 2015). Smahel and Blinka (2012) wonder whether, particularly young, individuals are still capable to dissociate online from offline. Internet nowadays is part of everyday life, and can just not be dissociated in offline and online (Blinka, 2013). As example, the results of the JAMES study in Switzerland by Waller et al. (2016) showed a decrease in the possession of personal "Internet access" (54% in 2012 to 37% in 2016), while 97% of them use Whatsapp daily (or almost). In other words, young people may just not be able to distinguish what Internet access means as it has become a normal part of their everyday life. Clearly, Whatsapp needs Internet access.

Having said that, this does not mean that Internet addiction does not exist, but it should sensitize that we need to distinguish what is an inevitable social change and what is a real public health problem.

2.1 Why does it look like Addiction or why does it not?

One of the major problems of research on Internet addiction is the current incapacity to agree on a definition or on diagnostic criteria to explain what leads to or follows from Internet addiction, or to agree if the problem is persistent or not (Kardefelt-Winther, 2014). After more than 20 years since the first "diagnose" of an Internet Addiction of Young (1996), the question whether there is (or not) an Internet addiction still remains open.

2.1.1 Arguments why it may be an addiction

The term Internet Addiction Disorder has been forged in 1995 by the psychiatrist Ivan Goldberg as a parody versus the rigidity of the DSM. Criteria to measure a new disorder have been proposed more like a joke. However, many of these "criteria" appeared to be relevant for a majority of readers, indicating that this "addiction" was assumed to be more real than was foreseen by the author (Goldberg, 1995).

In 1996, the psychologist Kimberly Young (1996) became the first to publish a detailed case report of a 43-years old female homemaker with addictive use of the Internet, similar to an alcohol addiction. The described women increasingly spent more time on the Internet, started earlier using it, and stayed longer than intended (signs of tolerance and signs of impaired control) on the Internet. She felt depressed, anxious, and irritable when she could not be on the Internet. She canceled appointments, stopped calling real life friends, reduced her interpersonal involvement with her family, quit social activities she once enjoyed, and stopped performing routine chores, such as the cooking, cleaning, and grocery shopping. She received criticism by her daughters and her husband and denied that she may have a problem with the Internet. The same year, at the annual meeting of the American Psychological Association in 1996, Young presented an article with the title "INTERNET ADDICTION: THE EMERGENCE OF A NEW CLINICAL DISORDER". This article presented an exploratory study of a group of user that could be labeled "Internet Addicts". In a first step, Young used a modified version of criteria for substance use disorder to screen problematic users. The findings of this study were that "normal" users of the Internet showed little negative effects, whereas addicted users reported significant impairment in their lives (Widyanto & Griffiths, 2006). Later, Young (1998b) developed the Internet Addiction Diagnostic Questionnaire (IADQ) which was basically guided by DSM-IV criteria of Pathological Gambling (PG), which at this time was defined as an impulse- control disorder (note that under DSM-5 gambling disorder has moved to Substance-Related and Addictive Disorders).

Following Young, other scientists started research on the existence of an Internet addiction (Brenner, 1997; Greenfield, 1999). Among this research was also a Swiss study of Egger and Rauterberg (1996), which concluded that there were significant differences in outcomes, however less than for substance use, between addicted and non-addicted users. The authors concluded that an addictive behavior could exist among certain Internet users.

In the following year, several studies were published, showing that addicted Internet users can in fact experience similar symptoms as were traditionally found for substance use disorders, i.e. salience, tolerance, withdrawal, mood modification, conflict and relapse (Kuss & Griffiths, 2012; Kuss et al., 2014b; Widyanto & Griffiths, 2006).

The assumption of an Internet addiction was strengthened by neuroscience. Neuroimaging studies have shown similarities between different substance-related addictions and Internet addiction. In a review about neurobiological research, Park and colleagues (2016) concluded that Internet use disorder shares many similarities with substance use disorders. Individuals with Internet addiction

showed a decrease of dopamine activity comparable to changes in dopaminergic activity induced by psychoactive substances. Similarly to substance use dependence, increased activities to Internet-related stimuli were found in the mesocorticolimbic system. These areas are connected with the development of conditioning through repeated rewards that may lead to habitual behavior. Additionally, some studies reported structural and functional changes in hippocampal areas, which were associated with reduced behavioral control and an impaired declarative memory process (Achab et al., 2015; Park et al., 2016; Rumpf et al., 2016). A systematic literature review conducted by Kuss and Griffiths (2012) concluded that, on the molecular level, Internet (and gaming) addiction is characterized by an overall reward deficiency that entails decreased dopaminergic activity. On the level of neural circuitry, Internet addiction led to neuroadaptation and structural changes that occur as a consequence of prolonged increased activity in brain areas associated with addiction. On a behavioral level, Internet addicts appeared to be constricted with regards to their cognitive functioning in various domains. In the same direction, Brand and colleagues (2014) concluded that neuropsychological and neuroimaging findings emphasized the classification of Internet addiction as an addiction because there are several similarities with findings on substance dependency.

Individuals with pathological gambling (or today called gambling disorder; currently the only behavioral addiction that has received scientific consensus and has entered a diagnostic system of mental disorders (DSM-5), and serving as a role model for Internet addiction) have long been shown to demonstrate the same patterns of cortical arousal as substance abusers. Dosing with the opiate antagonist naltrexone has mitigated problematic gambling behavior in some individuals and treatment with Selective Serotonin Reuptake Inhibitors has partly (not generally) been shown to be effective (Weinstein & Lejoyeux, 2010). It has been suggested that the same pathways may make the Internet rewarding and addictive as other behaviors. However, it seems more likely that the content on the Internet, such as online gambling, interactive games, or chatting would be what stimulates these reward systems, rather than simply the access to the Internet itself (see Yellowlees & Marks, 2007, for a review).

2.1.2 Arguments why it may not be an Addiction

2.1.2.1 Addicted to the Internet or on the Internet

One of the fundamental questions related to Internet Addiction is whether addicts are addicted “to” the Internet or “on” the Internet? Young (1999) claimed that Internet addiction is categorized in five subtypes (cybersexual addiction, cyber-relationship addiction, net compulsions, information overload, computer addiction). Griffiths (2000) argued that many of the users will not be addicted to the Internet, but they just use the Internet excessively as a medium to fuel underlying other addictions, i.e. being addicted on the Internet.

Researchers have proposed an important distinction between two different types of Pathological Internet Use, one focused on specific activities that are conducted through the Internet, such as online gaming or viewing pornography, and the other involving a generalized pattern of Internet use that is not restricted to a particular type of rewarding activity (Achab et al., 2015). The former is sometimes called Specific Pathological Internet Use: individuals are engaged in activities that are commonly conducted offline as well as online, with the Internet simply providing a means of access to the goal (Davis, 2001; King et al., 2011; Suler, 1999). In these cases, individuals are said to be “*addicted on the Internet*”. In contrast, Generalized Pathological Internet Use is characterized by behaviors that can be conducted only online, such as participation in chat groups and use of Facebook, Twitter, or other social media, and thus people can be “addicted to the Internet.”

In a review of some case studies, Widyanto and Griffiths (2006) showed that only a part of individuals labeled as Internet addicts were really addicted to the Internet, i.e. they used functions of the Internet that are not available with any other medium (e.g. chat rooms or role play games). They concluded that Internet addiction exists, but affects only a relatively small percentage of the online population. More determined critics, like Yellowlees and Marks (2007), state that Internet addiction does not exist; Internet is a medium and the excessive behavior (Internet addiction) is the response to a specific content or specific activities.

Independent of being addicted on the Internet, to the Internet, or claiming no addiction at all, there are individuals reporting negative consequences of their (excessive) Internet use comparable to other addictions (Widyanto & Griffiths, 2006). Even researchers in the camp of seeing Internet use not leading to a disorder have not denied the "addictive" features of the Internet, but generally assert that users are addicted to the material they find on the Internet, such as online gambling, shopping, or chatting. Nevertheless, these users are not addicted to the medium itself (Davis, 2001; Davis et al., 2002; Griffiths, 2000).

Therefore, other labels such as compulsive use for a maladaptive behavior have been suggested (Meerkerk, 2007), also because there is still too much dissension in the field concerning the question of whether people can become addicted to behaviors like gaming or Internet use. Frenk and Dar (2000) defined compulsion as ‘‘specific kinds of bad habits, consisting of dysfunctional, purposeful and repetitive behavior routines". These routines are usually attached to behaviors that carry short-term pleasure or relief of stress, but may result in negative long-term consequences. Meerkerk (2007), who has developed the CIUS questionnaire also prefers to use the term "compulsive Internet use", because he believes that the term "Internet addiction" implies an addiction to the Internet itself, whereas most so-called addicts are rather addicted to a certain Internet application such as pornography and online communication, which is expressed through compulsive use of the Internet.

2.1.2.2. Problematic Internet use may just be the distorted result of searching for a way to meet needs?

Internet can be beneficial for some people (i.e. people with physical handicaps or disabilities (see case study of Griffiths, 2000) or people with psychosocial problems (i.e., social anxiety), and can be used as a compensation whereby negative life situations can give rise to a motivation to go online to alleviate negative feelings (Kardefelt-Winther, 2014; Shepherd & Edelmann, 2005). This use can have positive and negative outcomes, some authors therefore believe that ‘‘addiction’’ is not the appropriate term to refer to a phenomenon of which excessive use can also be fulfilling and rewarding (see De Cock et al., 2014, for a review). As Kardefelt-Winther (2014) stated, "when the motivation to go online is grounded in an unmet real life need and where the Internet use alleviates the real life problem, an individual may feel a strong desire to spend more time online which could lead to problematic outcomes. Whether this is what we wish to call Internet addiction or not can be debated, as can the compulsive nature of such Internet use, but to suggest that this is a mental disorder seems to be a stretch" (p. 353).

2.1.2.3 Internet addiction and comorbidities: is there an independent disorder?

One concern about Internet addiction is that it has a high comorbidity with other psychiatric disorders, and the criteria proposed for the diagnosis are not unique (Black et al., 1999). Mitchell (2000) commented in the journal "Lancet" that a number of researchers do not believe Internet addiction deserves its own diagnosis because it is difficult to know whether Internet addiction develops on its own or is precipitated by underlying comorbid psychiatric illness. After more than a decade this question still remains open (Batra et al., 2014).

Carli and colleagues (2012) reviewed the link between pathological Internet use and psychopathology. The authors found that pathological Internet use is strongly associated with depression and symptoms of ADHD. Association with depression was found in 12 of 16 studies, with ADHD symptoms in all 5 studies, with obsessive-compulsive symptoms in 3 of 5 studies, with hostility/aggression in 4 of 6 studies and with anxiety in 4 of 7 studies. Similar results were described in another systematic review by Ko and colleagues (2012). A recent study of Sariyska and colleagues (2015) conducted on 895 participants in Germany showed a strong association of Internet Addiction Test score with both propensity for depression ($r=.247$, $p<.01$) and ADHD ($r=.335$, $p<.01$).

Shaffer and colleagues (2000) stated that in the majority of cases other primary disorders (than computer addiction) may provide a better explanation of "computer addiction". In a study conducted in Greece (Floros et al., 2014), 25 out of 50 participants presented with comorbidity of another Axis I disorder (specifically illustrated by schizophrenic disorders, borderline and mood disorders, antisocial and substance use disorders) and 38% (19/50) with a concurrent Axis II (personality) disorder. The majority of Axis I disorders (51.8%) were reported before the onset of Internet addiction, 33.3% after the onset while it was unclear in 14.8% of cases. Today, in a permanently connected world, it is difficult (or even impossible) to study if Internet addiction (if it exists) comes before or after another disorder. Shapira et al (2000) found in a sample of 20 patients that all had at least one lifetime DSM-IV Axis I diagnosis (mostly bipolar disorder) in addition to their problematic internet use. Kratzer & Hegerl (2008) found that 27 of 30 individuals with PIU had another psychiatric diagnosis (e. g. anxiety disorders in 50% of the cases).

As reviewed by Kuss et al. (2014a), comorbid symptoms have included alcohol and substance use, depression, social anxiety, schizophrenia, obsessive-compulsive disorder, and antisocial/aggressive behaviors. As reviewed by Weinstein and Lejoyeux (2010), among problematic Internet users rates of up to 78% rate of co-morbid depressive mood disorder have been found, and also high rates of anxiety disorders, hypomania, dysthymia, obsessive compulsive personality disorder, borderline personality disorder, and avoidant personality disorder.

In conclusion, it is unknown whether Internet addiction and comorbid disorders can be explained by shared risk factors, whether Internet addiction can to be considered as a secondary disorder, or whether problematic Internet use is a symptom of other primary disorders (Achab et al., 2015). Hence, there is not only the unanswered question whether an Internet use disorder actually exists at all, and if it exists whether it exists without comorbid other disorders. These uncertainties do not exclude that maladaptive internet use may cause additional harm or exacerbate harm of (comorbid) other disorders.

2.1.2.4 Can there be an addiction without chemical effects?

As Blaszczynski (2006) argued, the criteria for a disorder (Internet addiction) are extracted from another disorder (pathological gambling) simply on the argument that the phenomenon of the second is viewed as being the most akin to the first. Scales were designed to assess features found in substance abuse disorders without demonstrating the existence of pharmacological tolerance or withdrawal.

In the substance use disorder approach, tolerance (requiring more of the stimulus to get the same result) and withdrawal (experiencing negative consequences if you stop) are of utmost importance. In the domain of behavioral addictions, no biological change consistent with reported withdrawal experiences has been demonstrated for gambling and Internet use (Van Rooij & Prause, 2014). Both withdrawal and tolerance have not been established using physiological measures comparable to

those used in patients dependent on substances. Therefore, the use of terms such as withdrawal and tolerance appears to be either metaphorical or describe behavioral criteria, e.g. the patient's complaints of feeling irritable or anxious (Pies, 2009).

In conclusion, the lack of chemically operating withdrawal and tolerance is one of the major arguments of some researchers not to accept Internet Addiction as a "real" disorder, because it lacks criteria related to physical dependence (see also Griffiths et al., 2016).

2.2 Different theoretical concepts of problematic or addictive Internet use

As stated above, Internet addiction research is inconsistent in the definition (and measure) of the disorder but it has been commonly compared to substance use disorders, to "pathological gambling", an impulse control disorder as described in DSM-IV, or most recently to gambling disorder (GD), as the only behavioral addiction in DSM-5. Therefore, the criteria are generally based on DSM-IV or DSM-5 criteria (Bélanger-Lejars, 2015; Breslau et al., 2015; Laconi et al., 2014; Rumpf et al., 2016). Before the changes from DSM-IV to DSM-5, behavioral addiction did not exist as a disorder in DSM, even though the term was already used by several authors to describe non-chemical addictions. In addition, an alternative concept of problematic Internet use from cognitive-behavioral theory has emerged (Batra et al., 2014). All perspectives more or less agree (but see below) that negative consequences are present and that people are overly attached to computers and certain Internet functions, resulting in serious psychological, social, and professional dysfunctioning (Meerkerk, 2007). The main three traditions on which Internet Addiction were conceptualized are impulse control disorder, substance use disorder and cognitive behavioral theory (Achab et al., 2015). All three traditions share two common assumptions. The first assumption is that a core dimension of PIU involves a perceived loss of self-control over Internet use. Second, the three traditions share the assumption that PIU consists of both cognitive and behavioral dimensions (Tokunaga & Rains, 2016).

2.2.1 Addiction as stemming from substance use disorders (or later behavioral addiction)

Central in this theoretical perspective is (a) an increasing investment of resources on Internet-related activities, (b) unpleasant feelings (e.g., anxiety, depression, emptiness) when offline, (c) an increasing tolerance to the effects of being online, (d) denial of the problematic behaviors, and e) losing self-control over the Internet use despite having experienced problems. This perspective recognizes that users are not becoming addicted to the Internet in a manner corresponding to a chemical addiction; rather, they become addicted to and come to crave the euphoric sensations of dopamine release in the reward centers of the brain (Beard, 2005; Kim et al., 2011). Increased engagement with Internet use can cause functional impairment in users' personal relationships or professional performance.

2.2.2 Impulse control disorder

Young (1996) was not only the first to study Internet addiction, but also to define it as an impulse control disorder (similar to pathological gambling). A number of researchers have identified impulse control problems in conjunction with problematic Internet use (see Yellowlees & Marks, 2007, for a review). Likewise, others have shown that features of impulse control disorders are extremely common among excessive Internet users; some respondents frequently felt an urge to be online, felt that a world without the Internet would be dull, and became nervous if their Internet connection was slow. Many other impulse control disorders and ''behavioral addictions'' such as compulsive eating and shopping and kleptomania are thought to operate dopaminergically.

Central for Impulse Control disorders is the inability to control impulses involving Internet use, even if this leads to detrimental outcomes, marked by a tendency to act with less forethought stemming from the desire to make short-term gains instead of avoiding significant long-term consequences. Thus, the two core components of impulse control disorders, such as pathological gambling in DSM-IV, are a) impaired control and b) cognitive preoccupation (Grant et al., 2010). A third important dimension of impulse control disorders is c) using the behavior to escape problems or aversive mood states. Similarly to substance use disorders, d) tolerance and e) withdrawal are important. Finally, negative social and professional outcomes that are due to the behavior, including general health issues (Niemz et al., 2005) are important. Poor health conditions include excessive daytime sleepiness, lack of energy, physiological dysfunction, weakened immunity, obesity, and poor vision (see Kuss et al., 2014a, for a review).

2.2.3. Cognitive behavioral theory: PIU as an artifact of relational and relationship-building resource deficits)

In the cognitive behavioral tradition problematic Internet use (PIU) is a multidimensional syndrome consisting of cognitive and behavioral symptoms that result in negative social, academic, or professional consequences (Caplan, 2005). PIU is seen as an artifact of relational and relationship-building resource deficits, or, more precisely, as the product of deficits in offline relationships and relationship-building resources (Tokunaga & Rains, 2016).

The cognitive-behavioral theory has been used as an explanation for "PIU" for the first time by Davis (Davis, 2001), even if the term "pathological" (not problematic) was used by the author. In this model the behavior is caused by a predisposed vulnerability (psychopathology, i.e. depression or social anxiety) and a life event that catalyzes the process (the introduction of Internet or the discovery of a new function on Internet, i.e. pornography, auction service or chat). Maladaptive cognitions about the self (rumination, self-doubt, low self-efficacy and negative self-appraisal) or about the world (i.e. offline world is bad) are a central element to explain the development and the maintenance of PIU (Achab et al., 2015).

The model distinguishes between Specific Pathological Internet Use (i.e. gambling, shopping, sexual content) and Generalized Pathological Internet Use. Both involve spending much, if not "abnormal" amounts of time on the Internet, wasting time with no purpose, or spending vast amount of time in chat rooms. The Specific Pathological Internet Use is the result of a pre-existing psychopathology (i.e. pathological gambling, pathological use of pornography) while the Generalized Pathological Internet Use is related to the social context, support and isolation.

The theory was revised by Caplan (2003), proposing that individuals suffering from psychosocial problems (lonely and depressed individuals) may prefer online social interaction over ordinary face-to-face conversations. Preference for online interactions may facilitate compulsive Internet use and subsequent negative outcomes. Out of this theory, two often used questionnaires (also compared here below) were derived: the Generalized Problematic Internet Use Scale-2 (GPIUS-2, as an advancement of the GPIUS-1: Caplan, 2002; Caplan, 2010) and the Online Cognition Scale (OCS: Davis et al., 2002).

In the cognitive behavioral (relational resource deficits) perspective, part of the concept is a) uncontrollability over Internet use, b) personal communication efficacy, c) preoccupation, and d) mood alteration. An important distinction compared with the other two perspectives is that negative consequences are recognized as part of the PIU process, but these consequences are viewed as outcomes of PIU, not a central dimension of the construct.

The theory is criticized because it only attempts to explain PIU in a subgroup of people, namely those with a preference for social contact and communication via the internet, but cannot account for the whole PIU phenomenon, e.g. including gaming or sex addiction (Chakraborty et al., 2010).

2.2.4 Comparison what belongs theoretically to it and what not

Each of the three traditions highlights a unique feature of PIU that is not considered or has received significantly less attention in the other two traditions. Preoccupation and mood alteration are the central dimensions for PIU as an impulse control disorders and in the cognitive behavioral theory (relational resource deficits). Tolerance and withdrawal are central for impulse control disorders and substance dependence. For both theories negative outcome are necessary components, while for the relational theory they are not part of the core concept (Tokunaga & Rains, 2016).

2.3 Dimensions of Internet Use Disorder

Although, there is currently no official discrete psychiatric disease entity (independent disorder)in any classification systems such as the international classification of disease – version 10 (ICD-10), such a discrete entity was suggested for the DSM-5 version and there were speculations to also include this in the upcoming ICD-11, which is unlikely to happen (Grant et al., 2014; Grant & Chamberlain, 2016). However, on the one hand there is continued debate to have such an independent disorder, for which just evidence is not yet ripe to include it in classification systems. On the other hand, online gaming disorder are suggested for ICD-11 (beta draft) and is suggested for further research as is Internet gaming disorder in DSM-5. Therefore, we review here what could be potential criteria for such a disorder.

2.3.1 Precursor of Internet use disorder criteria: Gambling Disorder and Substance use disorders

Given the consideration of Internet addiction with substance use disorders and gambling disorders, we quickly review these aspects. According to Hasin and colleagues (2013) the 11 criteria in DSM-5 for substance use disorder (1. Hazardous use, 2. Social/interpersonal problems related to use, 3. Neglect of major roles, 4. Withdrawal, 5. Tolerance, 6. Using larger amounts/longer, 7. Repeated attempts to quit/control use, 8. Much time spent using it, 9.Physical/psychological problems related to use, 10. Activities given up, 11. Craving) can be clustered into 4 domains (quoted from Hasin et al., 2013).

1. **Impaired control,** which can be evidenced in using a substance for longer periods of time or larger amounts than intended (6); wanting to reduce use, yet being unsuccessful doing so (7); spending excessive time getting/using/recovering from the drug use (8); craving for the substance that are so intense that it is difficult to think about anything else (11).
2. **Social impairment,** because Addiction is a repeated involvement with a substance despite the substantial harm it causes, because that involvement is pleasurable and/or valuable. People may continue to use a substance despite problems with work, school or family/social obligations (3), and result in interpersonal problems such as losing friendships/family (2) or giving up of important social and recreational activities (10).
3. **Risky use** is the failure to refrain from using the substance despite in physically dangerous situations such as operating machinery or driving a car (1) or even if they were aware that it is causing or worsening physical and psychological problems, such as continued smoking despite having a respiratory disorder (9).
4. **Pharmacological indicators: Tolerance and Withdrawal.** Tolerance occurs when people need to increase the amount of a substance to achieve the same desired effect, whereby "desired

effect" might be the desire to avoid withdrawal symptoms or to get high (5). Withdrawal is the body's PHYSILOGICAL response to the abrupt cessation of a drug, once the body has developed a tolerance to it.

Gambling disorder in DSM-5 is defined as follows:

A. Persistent and recurrent problematic gambling behavior leading to clinically significant impairment or distress, as indicated by the individual exhibiting four (or more) of the following in a 12-month period:
    1. Needs to gamble with increasing amounts of money in order to achieve the desired excitement.
    2. Is restless or irritable when attempting to cut down or stop gambling.
    3. Has made repeated unsuccessful efforts to control, cut back, or stop gambling.
    4. Is often preoccupied with gambling (e.g., having persistent thoughts of reliving past gambling experiences, handicapping or planning the next venture, thinking of ways to get money with which to gamble).
    5. Often gambles when feeling distressed (e.g., helpless, guilty, anxious, depressed).
    6. After losing money gambling, often returns another day to get even ("chasing" one's losses).
    7. Lies to conceal the extent of involvement with gambling.
    8. Has jeopardized or lost a significant relationship, job, or educational or career opportunity because of gambling.
    9. Relies on others to provide money to relieve desperate financial situations caused by gambling.
B. The gambling behavior is not better explained by a manic episode.

2.3.2 Young's and Griffiths' criteria according to behavioral addiction and impulse control disorder (pathological gambling in DSM-IV)

According to Young, the following criteria have already been developed in 1996 (presented at a conference, published 1998 (Young, 1998b). They mirror 7 of the DSM-5 criteria (see above chapter 2.3.1) of gambling disorder, whereby chasing of losses (criterion 6 above chapter 2.3.1) and relying on others' money (criterion 9 above chapter 2.3.1) as typical gambling criteria were not included. Added was the following question 8 (longer than intended), which is not explicitly stated among the criteria for gambling disorders.

1. Do you feel preoccupied with the Internet (think about previous on-line activity or anticipate next on-line session)?
2. Do you feel the need to use the Internet with increasing amounts of time in order to achieve satisfaction?
3. Have you repeatedly made unsuccessful efforts to control, cut back, or stop Internet use?
4. Do you feel restless, moody, depressed, or irritable when attempting to cut down or stop Internet use?
5. Do you stay online longer than originally intended?
6. Have you jeopardized or risked the loss of significant relationship, job, educational or career opportunity because of the Internet?
7. Have you lied to family members, therapist, or others to conceal the extent of involvement with the Internet?
8. Do you use the Internet as a way of escaping from problems or of relieving a dysphoric mood (e.g., feelings of helplessness, guilt, anxiety, and depression)?

In the same year as Young, Griffiths (Griffiths, 1996b; Griffiths, 2005) developed a component model of addiction which included non-chemical (behavioral) addictions, and was applied to Internet addiction (Griffiths, 1996a; Griffiths, 1999). Components are:

- **Salience**, i.e. activity becomes most important in one's life leading to preoccupation and cognitive distortions, craving and deteriorated socialized behavior,
- **Mood modification**, which includes both to get a buzz or being high or used as a coping strategy or tranquilizing feeling of escape,
- **Tolerance**, i.e. increasing amounts of a particular activity to achieve the same effects such as spending more time on-line to experience the mood-modifying effects,
- **Withdrawal**, e.g. unpleasant feelings or physical effects (shakes, moodiness, irritability) that occur when the particular activity is discontinued or suddenly reduced,
- **Conflict**, which can be interpersonal conflicts or conflicts with other activities (job, social life, hobbies) or even intrapsychic conflicts. Intrapsychic conflict may also be experienced in the form of addicts knowing that they are engaged heavily in the behavior and want to cut down or stop – but find they are unable to do so, experiencing a subjective loss of control.
- **Relapse**, i.e. the tendency for reversion to earlier patterns even after years of abstinence or controlled activity.

2.3.3 Criteria for DSM-5 Internet Gaming Disorder

With the DSM-5 Internet gaming disorder (IGD) as a potential behavioral disorder explicitly referring to the Internet, is not yet an accepted disorder but placed under the category of potential disorders needing further research and clinical experience prior to consideration for inclusion as an official disorder (i.e. in the research appendix). The following criteria (American Psychiatric Association (APA), 2013; Petry et al., 2014; Petry et al., 2015) were suggested:

1. **Preoccupation**, which relates to being all-absorbed by gaming thoughts and should be present not only while playing but throughout the day when engaged in other activities as well (wording in DSM-5: The individual thinks about previous gaming activity or anticipates playing the next game Internet playing becomes the dominant activity in life. Note: excludes Internet gambling -> under gambling disorders). Preoccupation is a cognitive process that should be distinguished from transient enthusiasm while playing. The individual must be thinking about games not only while playing but also during times of non-play, with excessive thoughts about gaming occurring throughout the day. As argued by Griffiths and colleagues (2016) with respect to Internet gaming, individuals see gaming as central to their lives and could not imagine their lives without gaming.
2. **Withdrawal** refers to symptoms that arise in situations in which the person does not have the opportunity to play or attempts to stop or reduce playing (DSM-5: typically described as irritability, anxiety, or sadness but no physical signs of pharmacological withdrawal). Withdrawal symptoms associated with gaming must be distinguished from emotions that arise in response to an external force preventing or stopping a gaming episode. If a parent abruptly disconnects the Internet during a game, a child is likely to express extreme emotions. These abrupt emotional responses, however, are not withdrawal symptoms. Withdrawal refers to symptoms that arise when one is unable to initiate gaming, and/or when one is purposefully trying to stop gaming (Griffiths et al., 2016; Petry et al., 2014).
3. **Tolerance** represents an increase in time spent playing due to a growing desire to play or need for more exciting games. (DSM-5: the need to spent increasing amounts of time engaged in Internet games). Tolerance is characterized by an increasing dosage or amount of

time spent in an activity to feel its desired effects. As stated by Petry and colleagues (2014), many individuals who play video games, including those without any problems, report playing longer than intended, even when playing the first time. This does not necessarily represent tolerance which takes time and experience to develop. The concept of tolerance is highly criticized for behavioral addictions (e.g. Griffiths et al., 2016) as there is a) no ingested substance, which produces a pharmacological effect, b) increasing time is often not possible for addicted players playing already a large amount of time, and c) more exciting games or upgrading equipment may be related to the technological development of games or type of games played (e.g. a player may lose interest in a goal-based game when the goal is reached). In addition for Internet use, time only may not be a criterion any longer as one may be connected to the Internet all day (e.g. via smartphones). The international expert group of Griffiths and colleagues (2016) suggest not to make increased time as the only criterion, but also whether - given the same time - the use of the Internet (gaming) no longer produces the same initial satisfaction or excitement.

4. **Unsuccessful attempts to control or stop playing** includes a desire to reduce playing; this criterion also reflects a tendency to relapse (DSM-5: unsuccessful attempts to control participation in Internet games). Inquiries about this criterion should focus not only on attempts to stop but also attempts to cut down or reduce gaming, and being unable to do so.
5. **Loss of interest in other hobbies or activities** refers to a constriction of behaviors in favor of game playing, as one ceases or reduces other social and recreational activities that were previously enjoyable (DSM-5: Loss of interest in previous hobbies as a result of, and with the exception of, Internet games). This construct has been referred to as 'behavioral salience', in contrast to the cognitive salience described as preoccupation. A major critique is that such a criterion may reflect a major depression, which often co-occurs with IGD and shares some genetic variance. The expert committee around Griffiths and colleagues (2016) suggest to use this criterion as a secondary indicator, and perhaps to better focus on loneliness and social isolation due to Internet gaming.
6. **Continued excessive play despite the knowledge that problems** caused by the excessive gaming have already occurred. These problems should be clinically significant, not simply mild or transient issues. It should interfere with functioning (DSM-5: …despite knowledge of psychosocial problems). In contrast to the corresponding substance use disorder criterion, which may be related to persistent physical or psychological problems, in the case of gaming, the negative consequences are more likely to be psychosocial than physical in nature. Implicit in the criterion is that the problems are persistent and significant (not only once having gotten too less sleep), negative consequences must involve central areas of functioning, and effects of little clinical relevance should not be considered (e.g. neglecting household chores that do not cause difficulties). Social and developmental aspects should be considered because dysfunction will manifest differentially based on age (e.g. school, work, parents, partners).
7. **Deception**, i.e. individuals may also conceal or overtly lie about the extent of playing (DSM-5: has deceived family member, therapists or others regarding the amount of Internet gaming). The social environment should be considered in assessing this criterion. Adults living on their own may be less likely to lie about or hide gaming than a child living with parents. Nevertheless, gaming that has risen to a level such that the individual is hiding it from others implies that it has become problematic. This criterion heavily depends on age (e.g. parents trying to cut down Internet use) and whether the gamer lives alone. As indicated by Griffiths

et al. (2016), such a criterion is rarely included in diagnostic IGD instruments, and if so, it has a low diagnostic accuracy.

8. **Escape or relief from a negative mood** means playing to forget about real-life problems or to relieve negative mood states (DSM-5: Internet games to escape from or relieve negative mood (feelings of helplessness, guilt, anxiety)). Gaming becomes a method to modify moods or cope with difficulties. Gaming to escape adverse moods should be distinguished from gaming to avoid withdrawal symptoms, because some withdrawal symptoms have overlap with adverse moods. This criterion is intended to refer to gaming in response to feelings of sadness, depression or anxiety that arise from personal situations largely unrelated to gaming.
9. **Jeopardized or lost a relationship, job or educational or career opportunity** because of excessive game playing. (DSM-5: Has lost or jeopardized a significant relationship, job, or career opportunity because of gaming). This is one of the most severe symptoms associated with gambling disorder. It refers to having actually lost, or nearly lost important relationships or vocational/educational opportunities because of gaming. This criterion is intended to reflect more substantial issues than neglecting a homework assignment or being late for school or work due to gaming, behaviors that are more consistent with criterion 6. As argued by Griffiths an colleagues (2016), the potential as a barrier for seeking opportunities (not only losing them) should be included.

When comparing different operationalizations and related concepts such as substance use disorders or gambling disorder, there is a large overlap in criteria that could be used to define also criteria for Internet Use Disorder, assuming such a disorder receives further confirmation in future studies (Table 1). Central are criteria such as **withdrawal** and **tolerance**, although these dimensions are not seen to be pharmacological (as for substance use disorders). A further central criterion is cognitive **preoccupation** or salience. This has no direct relation to substance use disorders, but in our opinion has some relation with the operationalization of craving in the substance use field. Although craving is classified as an aspect of impaired control (Hasin et al., 2013), items in assessment instruments refer to cognitive aspects (e.g., In your entire life, did you ever want a drink so badly that you couldn't think of anything else?, Cherpitel et al., 2010). **Impaired control** (unsuccessful attempts to cut down or stop) similarly is a criterion that is unanimously used. It should be noted on the one hand that impaired control in Griffiths' terminology is included in "conflict" as intrapsychic conflict. On the other hand, Griffiths' unique criterion of "relapse" is seen as being part of impaired control (Meerkerk, 2007; Petry et al., 2015). There is also a general agreement that the experience of **negative consequences** is an important, if not even a required criterion (Griffiths et al., 2016), which should include severe consequences such as loss of relationships or career opportunities, as well as less severe but clinically significant problems (continued Internet use despite already experienced problems). Actually, we feel that it is important to measure interpersonal problems and neglect of major roles (particularly job opportunities and careers, or school education for adolescents and children) independently and not lumped together in a single criterion. We agree with Griffiths and colleagues (2016) that "**giving-up other activities**" is a weak criterion due to its proximity as criterion for affective disorders, but also because there may be nothing wrong with using the Internet instead of spending time on less enjoyable activities such as gardening or collecting stamps. If this "giving-up" affects important activities, the criterion is included in neglect of major roles. In our opinion, this criterion should reflect giving-up activities resulting in loneliness or social isolation. As a final criterion **mood modification**, mainly as escape from negative states is an important criterion for Internet use disorder.

We think that items clearly related to gambling only (chasing one's losses, reliance on others money) have nothing to do with Internet use disorders. Similarly, criteria such as "longer as intended" or "time spent to obtain a substance or to recover from effects" seem to be relevant for substance use only, particularly as time of Internet use as sole criterion is a questionable concept (Griffiths et al., 2016). These criteria were also omitted in e.g. Tao et al.'s (2010) empirical study using clinical validation of the criteria. We also believe that deception, although used as criterion for Young's Internet addiction or DSM-5 suggested Internet Gaming Disorder is fraught with problems of depending on age (parents controlling children) and living situation (alone or with others). In addition, deception as a criterion could be eliminated empirically in a study of Tao end colleagues (2010).

Table 1 Criteria for DSM-5 substance use disorders, Internet gaming disorders, gambling disorders, Internet addiction as defined by Young and behavioral addiction as formulated by Griffiths

<table>
<tr><th>Criteria</th><th>Internet gaming disorder</th><th>Young</th><th>Griffiths</th><th>Gambling Disorder</th><th>Substance use disorder</th><th>Substance use (4 main domains)</th></tr>
<tr><td>Withdrawal</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td rowspan="2">Pharmacol. indicators</td></tr>
<tr><td>Tolerance</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td></tr>
<tr><td>Preoccupation</td><td>X</td><td>X</td><td>X (salience)</td><td>X</td><td>X</td><td></td></tr>
<tr><td>Craving</td><td></td><td>X</td><td></td><td></td><td>X</td><td rowspan="5">impaired control</td></tr>
<tr><td>Longer/more than intended</td><td></td><td>X</td><td></td><td></td><td>X (includes larger amounts)</td></tr>
<tr><td>Much time spent to obtain substance or recover from effects</td><td></td><td>X</td><td></td><td></td><td>X</td></tr>
<tr><td>Relapse(reversion to earlier patterns after periods of abst.)</td><td></td><td>X</td><td>X</td><td></td><td></td></tr>
<tr><td>Unsuccessful attempts to stop/reduce/control use</td><td>X</td><td>X</td><td rowspan="4">Conflict</td><td>X</td><td>X</td></tr>
<tr><td>Giving up other activities</td><td>X</td><td></td><td></td><td>X</td><td rowspan="3">social impairement</td></tr>
<tr><td>Risk to lose relationships</td><td rowspan="2">jeopardized or lost relationship or job/ career</td><td rowspan="2">jeopardized or lost relationship or job/career</td><td rowspan="2">jeopardized or lost relationship or job/ career</td><td>social/interpersonal problems</td></tr>
<tr><td>Neglect of major obligations</td><td>X</td></tr>
<tr><td>Continued activity despite problems</td><td>X</td><td></td><td></td><td>X</td><td rowspan="2">risky use</td></tr>
<tr><td>Hazardous use (driving, operating machinery)</td><td>X</td><td></td><td></td><td></td><td>X</td></tr>
<tr><td>Deception</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td></tr>
<tr><td>Escape adverse moods / mood modification</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td></tr>
<tr><td>chasing one's losses</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td></tr>
<tr><td>relying on others money</td><td></td><td>X</td><td>X</td><td>X</td><td></td><td></td></tr>
</table>

2.4 Working definition of Internet Use Disorder

There is an increasing debate trying to find a consensus definition of "Internet (Gaming) Addiction" (Chakraborty et al., 2010; Griffiths et al., 2016; Petry et al., 2014), and there are particularly attempts for consensus statements also in Switzerland (Richter et al., 2016) and the neighboring country of Germany (Rumpf et al., 2016). Almost all "consent statements" come to the conclusion that there is currently no unanimous consensus in field. It is important for us to note that we do not believe to be smarter, i.e. being able to find such an internationally agreed definition. We attempt to suggest working definitions for further debate.

However, there is a wide variety of terms used to label the phenomenon that, although mostly used interchangeably, give the impression of different concepts or different degrees of severity. Is problematic, excessive or compulsive use of the Internet different from Internet addiction, cyberaddiction or Internet dependence? We suggest that the wording should in fact reflect the two major schools of thinking: A potential independent disorder for future inclusion in classification systems on the one hand, and, on the other hand, one where the Internet is the medium used to satisfy needs or to cope with behavioral problems. At the high end the behavior may be "addictive", but would otherwise exist even without the use of the Internet. In other words, we differentiate between addiction (or addictions) TO the Internet and problematic use, which may include addictions ON the Internet.

In our understanding, terms like Internet dependence, Internet addiction, or cyberaddiction are synonyms describing a potential future independent diagnosis of a mental disorder. We prefer the term disorder over addiction or dependence, because disorder is the term used in DSM, dependence is too strongly related to physical dependence introduced by a substance, and even for ICD there are reflections to abandon terms like addiction and abuse in favor of less pejorative and stigmatizing terms (WHO Expert Committee on Drug Dependence, 2012). In addition, there is no word for addiction in Italian, and mostly dependence (dipendenza) is used. The same is true for German, and therefore "Abhängigkeit" (dependence) or "Sucht", a word which has its origin in "dahin siechen" (waste away), have been used interchangeably. It is important to note that addiction and dependence is not the same (O'Brien et al., 2006). The German "Störung" (disorder) or the Italian "disturbo" may overcome the general confusion of terms and introduce a more clinically defined phenomenon. We suggest that terms like addiction, disorder or dependence should only be used, when meant in the direction of an independent clinical diagnosis. If there is an underlying assumption of an "addiction ON the Internet", i.e. not being an addiction TO the Internet, we suggest to clarify this assumption by using other labels such as problematic, compulsive or excessive use, whereby we prefer problematic use (see below).

Internet Use Disorder (or alternative terms of dependence or addiction) refers to a clinically significant behavior that either is impossible without the Internet (email/text messaging/social media) or would not have occurred, although theoretically possible, without the access to Internet, and which would not be replaced by a similar offline behavior in the absence of the Internet. Thus, it is seen as an addiction to the Internet, whereby theoretically the behavior can also be possible without the Internet (and we argue that almost all behaviors are possible without the Internet, e.g. instead of emails snail mails can be sent). Classically, there are at least three subtypes labeled as "excessive gaming", "email/text messaging" (we would clearly include social media use), and "sexual preoccupations" (Block, 2008; Tao et al., 2010; Weinstein & Lejoyeux, 2010). As an example for Addiction to the Internet, drawn from gambling: there are gamblers, who just do not like the social

interaction/atmosphere in casinos, and therefore gamble at home via the Internet. They theoretically could go to a casino. However, if there is no Internet access, they will not do so. Note that Internet gambling is excluded as Internet Use disorder in DSM-5. If, however, as they would not gamble in casinos without access to the Internet, they would be, in our definition be addicted to the internet. The gambling example serves for illustration as a behavior that theoretically could be practiced without the Internet, but some individuals would probably not or only rarely show that behavior without the Internet. Actually, in our terminology, we would include Internet gambling disorder as a subtype of Internet use disorders. Those individuals are, in our terminology, addicted to the Internet. This is distinct from addiction on the Internet, where the addiction would exist anyway, even if there was no Internet (e.g. a gambler who plays in casinos and on the internet, and would play in casinos if Internet was not available). To give another example: games can be played together with others on a table without the Internet, or offline in direct social interaction, but some individuals strongly (almost exclusively) prefer to play Massively Multiplayer Online Role-Playing Games (MMORPGs) in an anonymous private setting in the Internet, and would probably game less without the Internet. Similarly, some individuals "excessively" watch pornographic material on the Internet only, and would not act it out with prostitutes or in swinger clubs. Hence, the disorder is predominantly developed by Internet use. In this definition, Internet use for this behavior is not added to a behavior that occurs also otherwise (e.g. sex addict who often has sexual contact with others and regularly watches pornographic material on the internet).

We see Internet Use Disorder as an umbrella term like substance use disorders with subtypes, e.g. related to gaming, social media, or sex, whereby there may also be a generalized Internet use disorder, similar to polydrug use, where more than one of the subtypes may occur. In addition, for an Internet Use Disorder to be diagnosed, underlying other primary mental disorders such as psychotic disorders, bipolar or unipolar disorder, or personality disorders such as ADHD, for which problematic Internet use is secondary should be ruled out.

Working definition Internet Use Disorder

Internet Use Disorder is an ESSENTIAL persistent and recurrent Internet usage leading to clinically significant impairment or distress, as indicated by the individual with exhibiting four* of the following 7 criteria for an excess of at least 3 months**:

1. **Preoccupation** with the Internet. Preoccupation is a cognitive process to be distinguished from transient enthusiasm while being on the internet. The individual must be thinking about Internet use not only while being on the Internet but also during times of being offline, with excessive thoughts about Internet use occurring throughout the day. For individuals Internet use is central to their lives. They think about previous online activity or anticipate next online session.
2. **Withdrawal,** as manifested by a dysphoric mood, anxiety, irritability, sadness and boredom. Withdrawal symptoms must be distinguished from emotions that arise in response to an external force preventing or stopping an Internet episode. Withdrawal refers to symptoms that arise when one is unable to initiate the use of the Internet for a certain period, and/or when one is purposefully trying to stop Internet use.
3. **Tolerance**, as manifested by a marked increase in Internet use required to achieve satisfaction, or reduced satisfaction when using it the same time.
4. **Impaired control** manifested in unsuccessful attempts to control, cut back or discontinue Internet use with a persistent desire to do so. The criterion also reflects a tendency to relapse.
5. **Continued excessive use of Internet despite knowledge of persistent or recurrent physical, but mostly psychosocial negative consequences (functional impairment).** Consequences should be clinically relevant not only single periods of insufficient sleep or delayed homework.
   a) persistent and recurrent neglect of major roles
   b) clinically significant health effects (e.g. sleeping problems)
   c) jeopardized or lost important relationships
   d) jeopardized or lost work, educational or career opportunities, including Internet use being a barrier to seek such opportunities.
6. **Loss of interests** in previous hobbies, entertainment as a direct result of, and with the exception of, Internet use leading to deprived social interactions, loneliness and social isolation.
7. Use of the Internet to **escape or relieve** a dysphoric mood (e.g. feelings of helplessness, guilt, anxiety). Internet use to escape adverse moods should be distinguished from use to avoid withdrawal symptoms, because some withdrawal symptoms have overlap with adverse moods. This criterion refers to Internet use in response to feelings of sadness, depression or anxiety that arise from personal situations largely unrelated to Internet use.

Exclusion criterion:
Excessive Internet use which is better accounted for as a secondary symptom of other primary mental disorders
**Currently there is no suggestion for the number of criteria that should be met, we recommend using four
** Three months were suggested by Tao et al. (2010); standard definitions would refer to the occurrence in the past 12 months

2.4.1 What are most important dimensions empirically?

It is currently difficult for Internet use disorders (IUD) to define a cutoff of how many criteria must be met, or to define criteria which must be present. For Gambling Disorder (GD) four or more (out of 9) criteria must be met. For the DSM-5 suggested Internet Gaming Disorder (IGD) five (of 9) criteria

must be met. Tao et al. (2010) using assessment by psychiatrists for IUD using similar 7 criteria as we propose here, suggest that withdrawal and preoccupation must be present plus one of the remaining 5 criteria.

There is little research on the importance of dimensions for IUD. There is some research, however, on IGD which may also be indicative for IUD. In response to Petry et al (2014), some of the experts of Griffiths et al. (2016) suggest that for IGD the criterion of "jeopardized or lost relationships or career opportunities" should be a "must". Rehbein et al. (2015) using a screening instrument based on DSM-5 criteria for IGD found that in order to meet at least 5 criteria, "give up other activities" and "tolerance" were most likely included. When denying "give-up other activities", withdrawal with tolerance were most likely to be endorsed criteria when meeting at least 5 criteria in general. Denying "give up other activities" and "withdrawal" basically ruled out a DSM-5 classification of IGD, suggesting that these criteria are particularly relevant for assessment of IGD. The "escape" criterion was often endorsed, but it was least associated with meeting four or more other criteria for IGD, which is in line with the observation of many recent studies (see Griffiths et al., 2016, for a review) that for IGD the criterion to escape or relieve a negative mood has low specificity, because many non-addicted gamers also play to escape problems in their lives. For "pathological" video gaming, Blaszczynski (2006) has argued that impaired control and harmful consequences should be considered fundamentally important.

Overall, there is little agreement, whether some criteria must be met, and if so which ones. Thus, we suggest that currently all dimensions are of importance.

2.5 Working definition of Problematic Internet Use

In our view, problematic Internet use (PIU) should be used when either the underlying theory (e.g. cognitive behavioral theory) excludes the existence of an Internet Use Disorder, or – under the assumption of the existence of an Internet Use disorder - the necessary number of criteria are not met. We would also favor PIU instead of IUD when not all criteria of IUD were assessed. We recommend to abandon terms like IUD (or Internet addiction or Internet dependence), when the aim is not to assess an independent Internet Disorder. We favor the term problematic Internet use (PIU) over terms like "excessive Internet use" or "compulsive Internet use", also because it is the most widely used term today.

Excessive use is often (but not always) used solely as a measure of frequency of Internet use as being indicative of PIU, commonly relying on measures of the amount of time spent online (Caplan & High, 2006; Richter et al., 2016). The central argument advanced here for PIU is that it involves more than simply an excess of time spent online. Shapira and colleagues (2003) proposed that PIU entails a combination of both cognitive preoccupation (i.e., thoughts about Internet use that are experienced as irresistible) and individual's inability to control their Internet use, which in turn leads to feelings of distress and functional impairment of daily activities. Clearly, such criteria are also part of IUD, but in the case of PIU the diagnosis of IUD has not been met.

The term compulsive may be confounded with compulsivity in mental disorders, obsessive-compulsive disorder or impulsive-compulsive spectrum disorders (see e.g. Weinstein & Lejoyeux, 2010). Although we confer with the definition often given in relation to compulsive Internet use such as ''specific kinds of bad habits, consisting of dysfunctional, purposeful and repetitive behavior routines, whereby people are overly attached to computers and certain Internet functions, resulting in serious psychological, social, and professional dysfunctioning. Hence, the consequences are an

important part of a definition of compulsive use, and we think this is important for the assessment of PIU, but we suggest to avoid the word "compulsivity" (not the behavior) in a definition of problematic Internet use in order to not confuse it with obsessive-compulsive disorders or impulsive-compulsive spectrum disorders.

In our definition of problematic Internet use, "Addiction *on* the Internet" are included, even if they would exist without Internet, thus without problematic Internet behavior, but the Internet is the preferred choice of the medium. For us it is important that "Addictions *on* the Internet" are behavioral addictions but not Internet addictions *per se*, because the addiction would probably exist without access to the Internet. However, when the use of the medium Internet created problems and consequences, or aggravated consequences, it is seen as problematic Internet use. The definition also includes problematic use by people with other mental disorders (ADHD, depression), which are aggravated by Internet use, even if the problematic Internet use is secondary to the disorder.

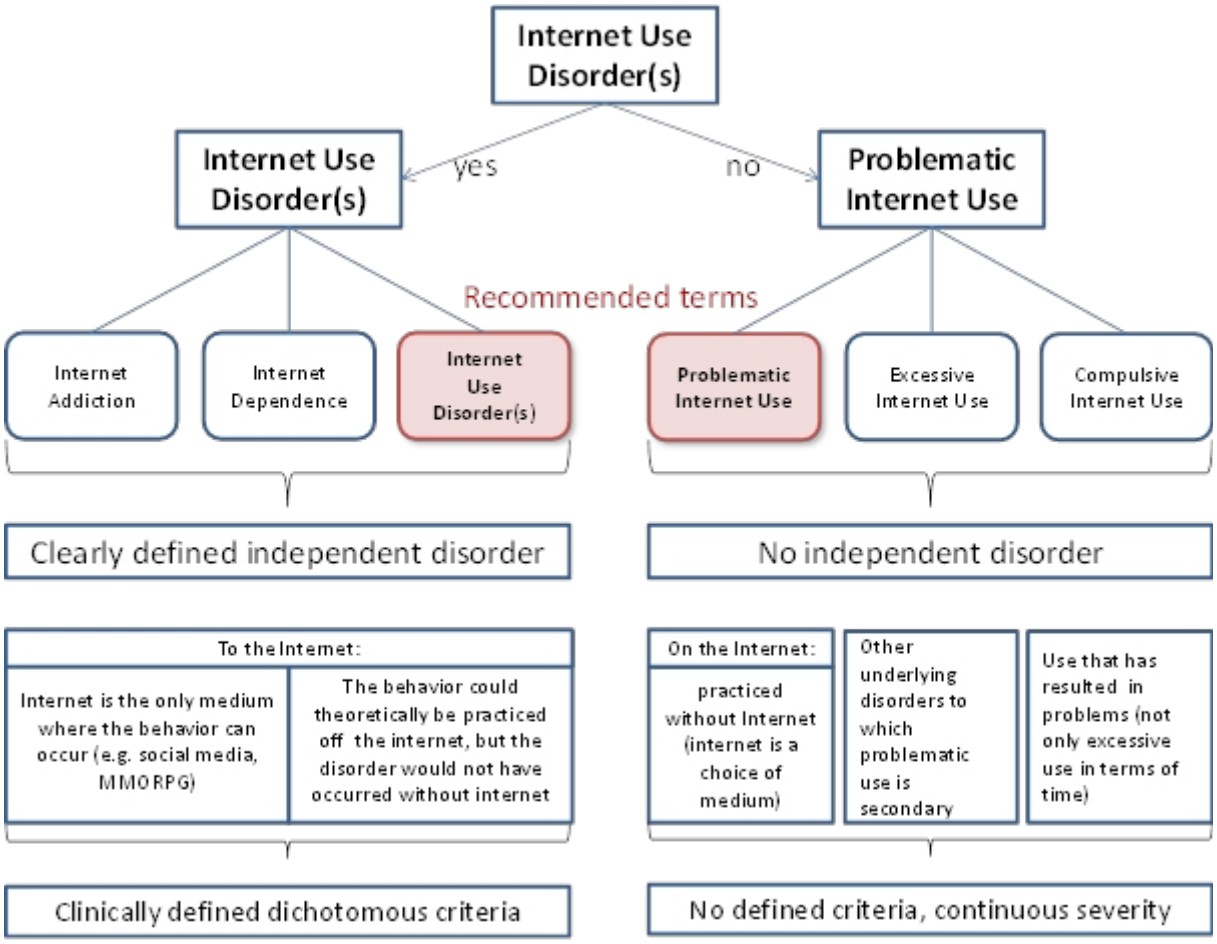
Clearly, our definition also includes mild forms, where only some aspects have occurred (e.g. without compulsivity). We propose a gradual concept without a clear cut-off. Problematic use can exist even without any underlying behavioral addictions or mental disorders. Some of the consequences criteria may be as severe as for the diagnosis of Internet Use Disorder, but overall the diagnosis of IUD cannot be met. Problematic Internet Use is more a severity continuum than a categorical (yes or no) concept, and excludes the diagnosis of an Internet use disorder.

Working definition Problematic Internet Use

5. PIU is a dysfunctional, purposeful and repetitive habit pattern which is expressed by cognitive preoccupation and has resulted in negative, behavioral, psychosocial or physical consequences (e.g. at home, work or school, inhibiting academic performance, damaging health). It may contain aspects of impaired control, tolerance or withdrawal, but central are developed negative consequences.
6. It is a gradual concept with continuously increasing severity (dimensional construct), not a diagnosis with a defined cut-off (categorical dichotomous construct).
7. Underlying other behavioral "addictions" (sex, gaming, shopping), other mental disorders for which the Internet is the choice of the medium or problematic Internet use is a symptom are included, but the diagnosis of Internet Use Disorder is not met.
8. Only nonessential computer/Internet usage (i.e., nonbusiness- or nonacademic-related use) should be evaluated.

Figure 1 gives an overview of our working definitions for Internet Use Disorder and Problematic Internet Use.

Figure 1 Conceptualization of working definitions of Internet Use Disorder (IUD) and Problematic Internet Use (PIU)



3. Assessment Instruments in the Literature

3.1 What does exist?

In a critical review of Internet Addiction measurement, Laconi and colleagues (2014) counted forty-five tools for the assessment of Internet addiction. We used this review as starting point for selecting the tools to be analyzed in this report. Since many of the tools have not been well-validated, we selected the tools with at least 3 validation articles. Eight scales were selected, but since the Chen Internet Addiction Scale (CIAS:Chen et al., 2003) has been validated and used only in Chinese population, the CIAS was excluded. Similarly, some instruments that were mainly used in the German speaking regions (Batra et al., 2014). were excluded. Additionally, because the originally selected Generalized Problematic Internet Use Scale has been revised, we included only the new one (Generalized Problematic Internet Use Scale 2 – GPIUS 2: Caplan, 2010). The remaining scales are: CIUS (Compulsive Internet use Scale: Meerkerk et al., 2009), IAT (Internet Addiction test: Young, 1998a), IADQ (Internet Addiction Diagnostic Questionnaire: Young, 1998b), IRPS (Internet Related Problem Scale: Armstrong et al., 2000), OCS (Online Cognition Scale: Davis et al., 2002), PIUQ (Problematic Internet Use Questionnaire: Demetrovics et al., 2008) and GPIUS-2 (Generalized Problematic Internet Use Scale 2: Caplan, 2010). We also excluded instruments designed for specific

Internet problems only (e.g. gaming, sex addiction). Two other systematic reviews about Internet addiction assessments tools (Kuss et al., 2014a; Lortie & Guitton, 2013) did not add new pertinent tools to our list. Similarly, the Rand review (Breslau et al., 2015) confirmed our choice, whereby in this report, two additional instruments were mentioned. These instruments had a very large number of items (59 or more), that seemed not to be usable in multi-topic general population surveys.

In addition to the 6 selected questionnaires, we added the ISS (Internetsucht Skala: Hahn & Jerusalem, 2010) which was developed and validated in Germany, and the IDS-15 (Internet Disorder Scale 15: Pontes & Griffiths, 2017) which actually is the only validated instrument based on the Internet Gaming Disorder definition of the DSM-5, and which could not yet be included in the earlier reviews.

According to Laconi et al. (2014) the *Internet Addiction Test* (Young, 1998a) emerged as the most frequently used scale for Internet Addiction, and appear to be the most validated assessment instrument (28 studies in 17 different languages). However, even if the IAT is commonly used as a multidimensional tool, and seems well adapted to evaluate the concept of Internet addiction, it lacks ‘‘rigorous and systematic psychometric investigations’’. This scale has cut-offs for "normal Internet use", "frequent problems", and "significant problems", but according to Kuss and colleagues (2014a) the cutoffs appear arbitrary as they are not based on empirical considerations, such as a clinical evaluation of disorder severity based on the presence and impact of symptoms. This instrument use pathological gambling criteria as theoretical basis.

The *Compulsive Internet Use Scale* (Meerkerk et al., 2009) is another well validated tool, and according to Laconi et al. (2014) it demonstrated good psychometric properties in terms of reliability and validity, with most studies supporting a 1-factor solution (6/7 studies). The low number of items is an argument in favor of the CIUS but there are no validated cut-off scores. Test-retest reliability have not been explored. This instrument uses substance dependence and pathological gambling criteria as theoretical basis.

The *Internet Addiction Diagnostic Questionnaire* (Young, 1998b) is a parsimonious 8-item self-report measure based on the diagnostic symptoms of pathological gambling (Kuss et al., 2014a). The tool appeared to be satisfactory even if fewer studies comparing it with other instruments have provided empirical support. Convergent validity and test-retest reliability have not been explored. The instrument is grounding in the DSM-IV criteria for pathological gambling and its dichotomous scoring could make it a useful tool for clinicians (Laconi et al., 2014). Endorsing five or more of the criteria indicates Internet Addiction (Kuss et al., 2014a).

The *Generalized Problematic Internet Use Scale-2* (Caplan, 2010) , according to Laconi et al. (2014), demonstrated good psychometric properties including a consistent 4-factor model. The proposed 8-point scale of the GPIUS-2 is not consistently used, including in validating studies. From an addiction perspective, not all items are relevant for addiction classification (Kuss et al., 2014a). This instrument uses substance cognitive-behavioral theory as theoretical basis as does the Online Cognition Scale (Davis et al., 2002), which again has no validated cut-off (Laconi et al., 2014).

The *Problematic Internet Use Questionnaire* (Demetrovics et al., 2008) is easy to administer (Laconi et al., 2014). Kuss and colleagues (2014a) reported this tool as having an overly simplistic classification, and lacks some addiction criteria. Convergent validity needs to be explored. This instrument use pathological gambling criteria as theoretical basis.

The *Internet Related Problem Scale* (Armstrong et al., 2000) has no validated cut-off score and the test-retest reliability has not been explored (Laconi et al., 2014). This instrument use substance dependence as theoretical basis.

The *Internetsucht Skala* has been validated and used only in Germany (Hahn & Jerusalem, 2010). The Internet Disorder Scale (Pontes & Griffiths, 2017) is a new instrument (published in January 2017) and uses the internet gaming disorder criteria of DSM-5 as theoretical basis.

3.2 Similarities and differences of major instruments

Most of the instruments share a high degree of overlap in the items and dimensions used. However, these dimensions often receive differing labels or dimensions contain items that are classified under other dimensions in other instruments. For example (see Appendix A), the complain of others about one's own Internet use is placed under the dimension "lack of control" in the IAT or "diminished impulse control" in the OCS (close to "impaired control" in our labeling), but is part of the dimension "conflict" in the CIUS", part of "neglect of social life" in the PIUQ or part of the dimension "negative effects" in the IRPS (close to "continued use despite problems" in our terminology). In some measurement instruments, single dimensions contain items that would spread over many different dimensions in other instruments. For example, the "diminished impulse control" dimension of the OCS contains items that would probably belong to "preoccupation" (e.g. "I often keep thinking about something I experienced online well after I have logged off"), to "impaired control" (e.g. "I use the Internet more than I ought to"), "continued use despite problems" (e.g. "People complain that I use the Internet too much"), or "loss of interest in other activities" (e.g. "The offline world is less exciting than what you can do online"). In other words, a dimension in one instrument may contain items that are part of other dimensions in other instruments.

Instruments are constructed to follow different theoretical concepts, e.g. (see Tokunaga & Rains, 2016, and chapter 2.2):

- Substance use disorder/behavioral addiction (IRPS, ISS, IDS-15)
- Impulse Control Disorder (CIUS; IAT, IADQ, PIUQ)
- Cognitive behavioral theory, relational and relationship-building resource deficits (OCS, GPIUS-2)

Therefore, it should be expected that instruments differ in their choice of dimensions covered according to the underlying theoretical concept. It should again be noted that some instruments model IUD after gambling disorder, which in DSM-IV was an impulse control disorder and now moved to substance-related and addictive disorders, being the only non-substance related disorder (behavioral addiction). Thus, the distinction whether an instrument is more based on impulse control disorders or substance used disorders, when modeled on gambling is not always clear.

Preoccupation and mood modification are central dimensions of PIU in the impulse control disorder and relational resource deficits tradition but not in the substance dependence tradition. Note, however, that craving has similarities to preoccupation. The substance dependence and impulse control traditions include tolerance and withdrawal as criteria for PIU or IUD, but are not criteria in the resource deficits perspective. The substance dependence and impulse control disorder perspectives also explain that negative outcomes are a necessary component for PIU to exist, whereas this is not the case from the relational resource deficits perspective, which recognizes outcomes as a construct empirically distinguishable from PIU.

In order to make instruments more comparable, we have rearranged items asked according to our 7 suggested dimensions used for Internet Use Disorder (Table 2 and Appendix B). As can be seen, tolerance is one of the dimensions that is often not covered by items. This is partly justified by the underlying theory (e.g. for the OCS and GPIUS-2 with the cognitive behavioral background), or explicitly explained for the CIUS by Meerkerk (2007), who does actually reject an Internet Use Disorder. However, it is surprising for instruments such as the IAT, IADQ or PIUQ that were adapted from Gambling Disorder, which under both the behavioral addiction (GD) and impulse control (PG) perspective should include tolerance. Most consistent with the underlying theoretical assumptions is the ISS, which uses substance –use related disorders as the role model and therefore excludes mood modification (escapisms). Interestingly, the IDS-15, which follows criteria of Internet Gaming Disorder as a suggested second behavioral addiction (besides gambling), does not include items assessing two important concepts, namely preoccupation and tolerance.

Table 2 Covered dimensions in evaluated instruments

	CIUS	IAT	AIDQ	IRPS	OCS	PIUQ	GPIUS-2	ISS	IDS-15
Preoccupation	✔	✔	✔	✔	✔	✔	✔	✔	
Withdrawal	✔	✔	✔	✔	✔	✔		✔	✔
Tolerance			✔	✔				✔	
Impaired control	✔	✔	✔	✔	✔	✔	✔	✔	✔
Continued use despite problems	✔	✔	✔	✔	✔	✔	✔	✔	✔
Loss of interest other activities	✔	✔		✔		✔		✔	
Escape/relieve negative emotions	✔	✔	✔	✔	✔		✔		✔

Remark: for wording of items of these instruments see Appendix A

It is clear that for instruments like the OCS and GPIUS-2 many items could not be classified, because the relational resource deficits tradition departs from the other two perspectives with a strong focus on relational elements, such as preference for online social interaction.

From our perspective of an Internet Use disorder, only the IRPS somewhat covers all dimensions, but the assessment of withdrawal with a particular mention of email use ("I feel anxious if I have not read my email or connected to the Internet for some time"), and tolerance ("The amount of information I get from the Internet is never enough", The time I spend online has increased over the last 12 months") is rather weak. In addition, the IRSP is an instrument with relatively many items, which makes it unsuitable in large health surveys, covering different health issues, or broader surveys on monitoring addiction including substance-related addictions.

3.3 Where do we stand with the CIUS?

In Switzerland, mainly the CIUS or the IAT are used. Under the presumption that for these instruments most data are available and therefore monitoring of prevalence and trends may be possible, we suggest not to switch to other instruments, which almost all have also deficits. Both are comparable, not including tolerance and having a single rather weak item of loss of interest in other activities. Additionally the IAT is weak on coping and mood modification. The item "Do you block disturbing thoughts about your life with soothing thoughts of the Internet?" is somewhat in between mood modification and preoccupation. In addition, the IAT is longer (20 items) than CIUS (14 items),

and even the length of the CIUS was problematic to be include in the Swiss Health Survey. Thus, the use of the CIUS can be considered a good choice.

3.4 Conclusion on instruments measuring problematic Internet use/Internet use disorders.

Currently, there are many different instruments measuring "problematic Internet use". Even if the name of the instruments refer to addiction, they actually do not measure all dimensions of a potentially distinct clinical disorder. Most instruments use Likert scales with undefined cut-offs when a criterion (dimension) is met. Thus, they do not allow a diagnosis of an Internet use disorder, where a certain number (e.g. 4 or 5) of criteria must be met. Hence, most instruments measure more or less the severity of problematic Internet use.

We therefore conclude that basically all instruments assess "only" problematic Internet use.

4. Concluding remarks

It is important for us to stretch, that - given the dissent in the field on definitions - we are well aware that "our" definition is not a final internationally accepted definition. Too many researchers including the working group of DSM-5 have tried so, and we are by far not cleverer or smarter. Our definitions are the answer to a mandate by the Federal Office of Public Health to come up with suggestions for working definitions. We also have to stress that even among the three authors of the present report there is no consensus, whether an Internet Use Disorder exist at all, or - if it existed - should include only behaviors that could not be exercised without the Internet (e.g. social media use). We have come up with a broader definition for IUD, because if only behaviors which necessitate the Internet were included, it may be better to refer to specific Internet use disorders (e.g. Internet gaming disorder, social media disorder, Internet sex disorder) and not to a generalized Internet use disorder. Our working definition is given under the assumption that future research will finally agree on the existence of an Internet Use Disorder, which nowadays is not the case.

4.1 Summary of findings and discussion

As repeatedly stated, there is no internationally or even nationally agreed consensus whether an Internet use disorder exists, or whether it is just a maladaptive behavioral pattern which is standing alone or comorbid with other psychopathologies. We think that the almost inflationary and often interchangeable use of different terms such as excessive use, compulsive use, addiction, dependence has not helped the field, but blurred two conceptionally different assumptions: Internet use that may result in a clinically independent disorder versus Internet use resulting in consequences without being a disorder. This may be related to different traditions on which definitions and assessment instruments for problematic or addictive Internet use are based, namely the substance use tradition, impulse control disorder tradition, and the tradition of cognitive behavioral theory.

We think the field can be largely divided into two groups. One group that assumes that an Internet use disorder exists and one group that does not, but assumes that Internet use can lead to negative consequences. Astonishingly, both groups, even coming from different traditions, identified similar phenomena describing the problematic or addictive behavior.

Accordingly, we came up with two definitions: one for an independent disorder, and one for problematic use. We suggest the term Internet use disorder over similar terms such as addiction or dependence, because it clearly places the clinical disorder in the center of this definition, and may not be confused with colloquial understandings(e.g. in the general population) of addiction. It is also more in line with current concepts of disorders instead of dependence in DSM-5. Dependence may be confused with chemically related developments of tolerance and withdrawal, which do not exist for behavioral addictions. If there is an independent Internet disorder, we think seven criteria describe best such a disorder: preoccupation, non-chemical tolerance and withdrawal, impaired control, continued use despite consequences, loss of interest in other activities, and mood modification (escapisms). The concept is categorical (not dimensional), i.e. the diagnosis is met or not.

Problematic Internet use can occur with or without underlying primary psychopathologies. The concept is – in the taxometric sense – dimensional, which means that problematic use lies on a severity continuum without definition of a clear cut-off point to distinguish between "diseased" or "not diseased". This does not exclude that different cut-offs can be defined to differentiate between mild, moderate, and severe PIU (as has been done for Substance use disorders, despite the

assumption of a dimensional construct. However, in our view this needs more empirical work to define such cut-offs. PIU should refer to nonessential computer/Internet usage (i.e., nonbusiness- or nonacademic-related use). It is characterized by cognitive preoccupation and has resulted in negative behavioral, psychosocial or physical consequences. It may include other symptoms such as impaired control, withdrawal or tolerance with different severity graduations, but essential is the continued use despite the experience of consequences.

Even more confusing than definitional differences is the number of different assessment instruments in the research field. Most of them again show a large overlap of comparable items. We identified eight most often used instruments, which have undergone at least some psychometric testing. Our conclusion is that actually none of these instruments cover well all criteria to assess Internet Use Disorder, and therefore none is suitable for the assessment of an Internet use disorder, but mostly measure problematic Internet use.

4.2 What do we think?

As stated above, there is no general agreement among our research team. However as a tendency, we do not believe in a generalized Internet use disorder. There may be some specialized Internet use disorders, such as Internet gaming disorder, but we believe there will probably never be a consensus in the field, and it is unlikely that such disorder(s) will find its entrance into classification systems of disease such as ICD or DSM.

However, we think that this is no obstacle for further research, because even those refusing the existence of a disorder agree that Internet use can lead to substantial problems and therefore is a public health problem. We strongly recommend not using time spent on the Internet as a (sole) criterion of problematic use, because with the rapidly increasing omnipresence of the Internet, its use will become ubiquitous and the time spent on the Internet is not necessarily a problem.

Finally, a diagnostic of a disorder would need clinical assessment, which cannot be obtained by asking questions in a survey. Hence, we see survey questionnaires mainly as a kind of screening instruments, which do not need the distinction of a disorder versus problematic use, because it generally measures "only" problematic behavior which may have resulted in clinically relevant problems, but would need a confirming clinical diagnosis anyway. In addition, all instruments currently in the field are at best – in our opinion – usable to screen for problematic behavior.

4.3 Where should we go?

On the path to Internet Use Disorders, there is the need, similar as for Internet Gaming Disorder (but see the debate of Griffiths et al. (2016) on the consent paper of Petry (2014)) to come up with a consent whether a generalized Internet use disorder exists or whether there are – if at all – only specific Internet use disorders. As a second step, international working groups such as for DSM-5 must be installed to define the criteria for these disorders (generalized and specific). Thirdly, a clear consent is needed, whether there are criteria that must be met for a diagnosis (e.g., is tolerance or withdrawal needed as a criterion) or can be met among others (see e.g. Tao et al., 2010, for a combination polythetic and monothetic criteria). If the decision is that not all criteria must be met, there is a need to define what the cutoff for the number of criteria is. For assessment instruments using rating scales, a cutoff for each criterion (item) must be set based on psychometrical testing with a clinical gold standard (e.g., on a five point scale from 1 to 5, is the criterion met with a value of 3 or greater or 4 or 5?).

On the problematic Internet use path (but also for the disorder path), the existence of consequences is an important criterion. Therefore, clear standards need to be defined, when something is a consequence. For example, is criticism by parents already signaling a "consequence" or just reflects the nagging of an older generation, which had a different socialization into a relatively new medium. It may be that this older generation just lacks use competence or lacks the understanding of its opportunities, or even of the necessity for the social life of their children. To give another example of defining a consequence: are (rare) episodes of insufficient sleep already indicative of a consequence?

For the development and use of assessment instruments a convergence towards a single preferred instrument would be desirable. However, more urgently needed would be psychometrically derived (and clinically validated) score levels indicating different degrees of severity. For example, it still lacks a validation study for e.g. a cut-off of 28 for the CIUS. Although there are some arguments to use such a cut-off (Rumpf et al., 2011), other authors argue for lower cut-off points (Bischof et al., 2013; Guertler et al., 2014). Psychometrical evaluations are even more needed when different cutoffs will be used to define different severity grades. In addition, more comparative research with the same instrument are needed to see whether "problematic use" has similar meanings in different countries. This particularly includes strict back-translation procedure for different languages and tests of differential item functioning across different cultures (i.e., does an item has the same importance for problematic use in all cultures?).

Thus, more international convergence in agreed criteria and items is needed to reduce the extreme variability in concepts, dimension and assessment instruments in order to foster internationally comparative research and thus strengthen research finding on what is problematic Internet use and to develop preventive strategies.

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Appendix A
Measurement Instruments, and original dimensions and corresponding items

Compulsive Internet Use (CIUS)

Meerkerk, Van Den Eijnden, Vermulst & Garrestsen (2009)

14 items / 5-point scale (never, seldom, sometimes, often, very often)

Loss of control

IC	1. Do you find it difficult to stop using the Internet when you are online?
IC	2. Do you continue to use the Internet despite your intention to stop?
CU	5. Are you short of sleep because of the Internet?
IC	9. Have you unsuccessfully tried to spend less time on the Internet?

Conflict

CU	3. Do others (e.g., partner, children, parents) say you should use the Internet less?
IC	8. Do you think you should use the Internet less often?
CU	10. Do you rush through your (home) work in order to go on the Internet?
CU	11. Do you neglect your daily obligations (work, school, or family life) because you prefer to go on the Internet?

Preoccupation

LI	4. Do you prefer to use the Internet instead of spending time with others (e.g., partner, children, parents)?
P	6. Do you think about the Internet, even when not online?
P	7. Do you look forward to your next Internet session?

Withdrawal symptoms

W	14. Do you feel restless, frustrated, or irritated when you cannot use the Internet?

Coping or mood modification

E	12. Do you go on the Internet when you are feeling down?
E	13. Do you use the Internet to escape from your sorrows or get relief from negative feelings?

P=Preoccupation; W=Withdrawal; T=Tolerance; IC=Impaired Control; CU=Continued Use Despite Problems; LI=Loss of Interest in Other Activities; E=Escape/Relieve of Negative Emotions; X = no dimension

Internet Addiction Test (IAT)

Young 1998

20 items / 5-point scale (rarely, occasionally, frequently, often, always)

Lack of control

IC	17. Do you try to cut down the amount of time you spend on-line and fail?
CU	5. Do others in your life complain to you about the amount of time you spend on-line?
IC	16. Do you find yourself saying “Just a few more minutes” when on-line?

Salience

LI	19. How often do you choose to spend more time online over going out with others?
X	13. How often do you snap, yell, or act annoyed if someone bothers you while you are online?
P	12. How often do you fear that life without the Internet would be boring, empty, and joyless?
P	15. Do you feel preoccupied with the Internet when off-line or fantasise about being on-line?
E	10. Do you block disturbing thoughts about your life with soothing thoughts of the Internet?

Excessive use

CU	2. Do you neglect household chores to spend more time on-line?
CU	14. Do you lose sleep due to late night log-ins?
W	20. Do you feel depressed, moody. Or nervous when you are off-line, which goes away once you are back on-line?
IC	1. Do you find that you stay on-line longer than you intended?
X	18. Do you try to hide how long you’ve been on-line?

Neglect of work

CU	6. Does your work suffer (e.g. postponing things, not meeting deadlines, etc.) because of the amount of time you spend on-line?
CU	8. Does your job performance or productivity suffer because of the Internet?
X	9. Do you become defensive or secretive when anyone asks you what you do on-line?

Neglect of social life

X	4. Do you form new relationships with fellow on-line users?
X	3. Do you prefer excitement of the Internet to intimacy with your partner?

Anticipation	
P	11. Do you find yourself anticipating when you go on-line again?
X	7. Do you check your e-mail before something else that you need to do?

P=Preoccupation; W=Withdrawal; T=Tolerance; IC=Impaired Control; CU=Continued Use Despite Problems; LI=Loss of Interest in Other Activities; E=Escape/Relieve of Negative Emotions; X = no dimension

Internet Addiction Diagnostic Questionnaire (IADQ)

Young 1998

8 items / yes or no

Addictive Internet use

P	1. Do you feel preoccupied with the Internet (think about previous on-line activity or anticipate next on-line session)?
T	2. Do you feel the need to use the Internet with increasing amounts of time in order to achieve satisfaction?
IC	3. Have you repeatedly made unsuccessful efforts to control, cut back, or stop Internet use?
W	4. Do you feel restless, moody, depressed, or irritable when attempting to cut down or stop Internet use?
IC	5. Do you stay on-line longer than originally intended?
CU	6. Have you jeopardized or risked the loss of significant relationship, job, educational or career opportunity because of the internet?
X	7. Have you lied to family members, therapist, or others to conceal the extent of involvement with the Internet?
E	8. Do you use the Internet as a way of escaping from problems or of relieving a dysphoric mood (e.g., feelings of helplessness, guilt, anxiety, depression)?

P=Preoccupation; W=Withdrawal; T=Tolerance; IC=Impaired Control; CU=Continued Use Despite Problems; LI=Loss of Interest in Other Activities; E=Escape/Relieve of Negative Emotions; X = no dimension

Internet Related Problem Scale (IRPS)

Armstrong, Phillips & Saling (2000)

20 items / 10-point scale ("not true at all" to "extremely true")

Withdrawal

P — 4. When not connected, I find myself wondering what is happening on the Internet.

P — 8. When I haven't been able to connect for some time, I become preoccupied with the thought of connecting.

IC — 11. I have tried to stop using the Internet for prolonged periods of time.

W — 13. I feel anxious if I have not read my email or connected to the Internet for some time.

P — 14. I have frequent dreams about the Internet.

Loss of control

IC — 5. I have tried unsuccessfully to cut down my amount of Internet use.

Escape from other problems

LI — 10. I have used the net to talk to others when I was feeling isolated.

E — 2. I have used the net to make myself feel better when I was down.

CU — 18. There are times when I would rather use the net than deal with other pressing issues.

Negative effects

CU — 12. My Internet use has replaced some of my usual sleeping hours.

CU — 15. My friends and family complain about my use of the Internet.

CU — 19. I am often late for appointments because I'm on-line when I shouldn't be.

CU — 7. I have received phone bills I couldn't afford to pay.

Tolerance

T — 1. The amount of information I get from the Internet is never enough.

T — 9. The time I spend online has increased over the last 12 months.

Reduced activities

CU — 16. My productivity at work (or school) has decreased as a direct result of the time I spend on the Internet.

LI — 3. I have given up some of my social and leisure time so I can spend more time on the net.

Related activities

P — 6. When not on-line, I spend a lot of time doing other things related to the Internet (e.g. buying and reading Internet magazines and books, re-organizing files of downloaded materials, trying out new WWW browers).

Craving

IC	17. I find myself connecting for longer periods of time than intended.

Introversion

X	20. I am the kind of person who feels more comfortable with objects than people.

P=Preoccupation; W=Withdrawal; T=Tolerance; IC=Impaired Control; CU=Continued Use Despite Problems; LI=Loss of Interest in Other Activities; E=Escape/Relieve of Negative Emotions; X = no dimension

Online Cognition Scale (OCS)

Davis, Flett & Besser (2002)

37 items / 7-point scale (rate the agreeableness)

Diminished impulse control

P	I often keep thinking about something I experienced online well after I have logged off.
X	When I am on the Internet, I often feel a kind of "rush" or emotional high.
IC	I use the Internet more than I ought to.
CU	People complain that I use the Internet too much.
IC	I never stay on longer than I had planned.
P	When I am not online, I often think about the Internet.
LI	The offline world is less exciting than what you can do online.
P	I can't stop thinking about the internet.
IC	Even though there are times when I would like to, I can't cut down on my use of the Internet.
IC	My use of the Internet sometimes seems beyond my control.

Social comfort

X	I am most comfortable online.
X	I feel safest when I am on the Internet.
LI	You can get to know a person better on the Internet than in person.
E	I often find it peaceful to be online.
X	I can be myself online.
X	I get more respect online than "in real life".
X	People accept me for who I am online.
X	Online relationships can be more fulfilling than offlines ones.
X	I am at my best when I am online.
X	I wish my friends and family knew how people regard me online.
LI	The Internet is more "real" than real life.
X	I say or do things on the Internet that I could never do offline.
X	When I am online, I can be carefree.

Loneliness/depression

X	Few people love me other than those I know online.

X	I am less lonely when I am online.
P	I cannot see myself ever without the Internet for too long.
P	The Internet is an important part of my life.
W	I feel helpless when I don't have access to the Internet.
IC	I am bothered by my inability to stop using the Internet so much.

Distraction

CU	When I am online I don't think about my responsibilities.
X	When I have nothing better to do, I go online.
IC	I find that I go online more when I have something else I am supposed to do.
E	When I am online, I don't need to think about offline problems.
X	I sometimes use the Internet to procrastinate.
CU	I often use the Internet to avoid doing unpleasant things.
CU	Using the Internet is a way to forget about the things I must do but don't really want to do.

P=Preoccupation; W=Withdrawal; T=Tolerance; IC=Impaired Control; CU=Continued Use Despite Problems; LI=Loss of Interest in Other Activities; E=Escape/Relieve of Negative Emotions; X = no dimension

Problematic Internet Use Questionnaire (PIUQ)

Demetrovics, Szeredi & Rózsa (2008)

18 items / 5-point scale (never, rarely, sometimes, often, always)

Control disorder

IC	3. How often do you feel that you should decrease the amount of time spent online?
IC	6. How often does it happen to you that you wish to decrease the amount of time spent online but you do not succeed?
X	9. How often do you try to conceal the amount of time spent online?
CU	12. How often do you feel that your Internet usage causes problems for you?
IC	15. How often do you realize saying when you are online, “just a couple of more minutes and I will stop”?
CU	18. How often do you think that you should ask for help in relation to your Internet use?

Obsession

P	4. How often do you daydream about the Internet?
P	1. How often do you fantasize about the Internet, or think about what it would be like to be online when you are not on the Internet?
T	7. How often do you feel tense, irritated, or stressed if you cannot use the Internet for as long as you want to?
W	10. How often do you feel tense, irritated, or stressed if you cannot use the Internet for several days?
W	13. How often does it happen to you that you feel depressed, moody, or nervous when you are not on the Internet and these feelings stop once you are back online?
P	16. How often do you dream about the Internet?

Neglect

CU	2. How often do you neglect household chores to spend more time online?
CU	5. How often do you spend time online when you’d rather sleep?
X	8. How often do you choose the Internet rather than being with your partner?
CU	11. How often does the use of the Internet impair your work or your efficacy?

Neglect of social life

CU	14. How often do people in your life complain about spending too much time online?
LI	17. How often do you choose the Internet rather than going out with somebody to have some fun?

P=Preoccupation; W=Withdrawal; T=Tolerance; IC=Impaired Control; CU=Continued Use Despite Problems; LI=Loss of Interest in Other Activities; E=Escape/Relieve of Negative Emotions; X = no dimension

Generalized Problematic Internet Use Scale 2 (GPIUS-2)

Caplan (2010)

15 items / 8-point scale (rate agreeableness)

Cognitive preoccupation

P	1. When I haven't been online for some time, I become preoccupied with the thought of going online.
P	2. I would feel lost if I was unable to go online.
P	3. I think obsessively about going online when I am offline.

Mood regulation

E	1. I have used the Internet to talk with others when I was feeling isolated.
E	2. I have used the Internet to make myself feel better when I was down.
E	3. I have used the Internet to make myself feel better when I've felt upset

Compulsive internet use

IC	1. I have difficulty controlling the amount of time I spend online.
IC	2. I find it difficult to control my Internet use.
IC	3. When offline, I have a hard time trying to resist the urge to go online.

Preference for online social interaction

X	1. I prefer online social interaction over face-to-face communication.
X	2. Online social interaction is more comfortable for me than face-to-face interaction.
X	3. I prefer communicating with people online rather than face to face.

Negative outcomes

CU	1. My internet use has made it difficult for me to manage my life.
CU	2. I have missed social engagements or activities because of my Internet use.
CU	3. My Internet use has created problems for me in my life.

P=Preoccupation; W=Withdrawal; T=Tolerance; IC=Impaired Control; CU=Continued Use Despite Problems; LI=Loss of Interest in Other Activities; E=Escape/Relieve of Negative Emotions; X = no dimension

Internetsucht Skala (ISS)

Hahn & Jerusalem (2010)

20 items / 4-point scale

Entzugserscheinungen

P	Ich beschäftige mich auch während der Zeit, in der ich nicht das Internet nutze, gedanklich sehr viel mit dem Internet.
P	Meine Gedanken kreisen ständig um das Internet, auch wenn ich gar nicht im Netz bin.
W	Wenn ich längere Zeit nicht im Internet bin, werde ich unruhig und nervös.
W	Wenn ich nicht im Internet sein kann, bin ich gereizt und unzufrieden.

Kontrollverlust

IC	Beim Internet-Surfen ertappe ich mich häufig dabei, daß ich sage: Nur noch ein paar Minuten, und dann kann ich doch nicht aufhören.
IC	Meine Leistungen in der Schule/im Beruf leiden unter meiner Internet-Nutzung.
IC	Ich habe schon häufiger vergeblich versucht, meine Zeit im Internet zu reduzieren.
CU	Ich gebe mehr Geld für das Internet aus, als ich mir eigentlich leisten kann.

Negative Konsequenzen Arbeit und Leistung

CU	Ich bin so häufig und intensiv mit dem Internet beschäftigt, daß ich manchmal Probleme mit meinem Arbeitgeber oder in der Schule bekomme.
CU	I am less lonely when I am online.
CU	Ich vernachlässige oft meine Pflichten, um mehr Zeit im Internet verbringen zu können.
CU	Wegen des Internets verpasse ich manchmal wichtige Termine/Verabredungen.

Negative Konsequenzen soziale Beziehungen

CU	Mir wichtige Menschen sagen, daß ich mich zu meinen Ungunsten verändert habe, seitdem ich das Netz nutze.
CU	Seitdem ich das Internet nutze, haben sich einige Freunde von mir zurückgezogen.
CU	Mir wichtige Menschen beschweren sich, daß ich zu viel Zeit im Netz verbringe.
LI	Seitdem ich die Online-Welt entdeckt habe, unternehme ich weniger mit anderen.

Toleranzentwicklung

T	Mittlerweile verbringe ich mehr Zeit im Internet als zu Beginn meiner Online-Aktivitäten.
T	Die Zeit, die ich im Internet verbringe, hat sich im Vergleich zur Anfangszeit ständig erhöht.
IC	Mein Verlangen danach, mehr Zeit im Internet zu verbringen, hat sich im Vergleich zu früher ständig erhöht.
LI	Mein Alltag wird zunehmend stärker durch Internet-Aktivitäten bestimmt.

P=Preoccupation; W=Withdrawal; T=Tolerance; IC=Impaired Control; CU=Continued Use Despite Problems; LI=Loss of Interest in Other Activities; E=Escape/Relieve of Negative Emotions; X = no dimension

Internet Disorder Scale (IDS-15)

Pontes & Griffiths (2017)

15 items / 5-point scale (strongly disagree, disagree, neither agree or disagree, agree, strongly agree)

Withdrawal symptoms

W	5. When I am not online I feel irritable, restless, anxious and/or frustrated.
W	6. I feel sad if I am not able to go online.
W	7. I tend to get anxious if I can't check what's happening online for any reason.
W	8. I feel restless every time I am unable to go online.

Loss of control

IC	13. I could easily stop spending time online if I wanted to without any problem.
IC	14. I can easily cut down the time I spend online any time that I want to.
IC	15. I am able to control and/or reduce the time I spend online.

Escapism and dysfunctional emotional coping

E	1. I never go online to feel better.
E	2. I think that being online can greatly change my mood for the better.
E	3. I go online to help me cope with any bad feelings I might have.
E	4. I go online to forget about whatever's bothering me.

Impairments and Dysfunctional Self-Regulation

CU	9. I think the amount of time I spend online has jeopardized the relationship with my partner.
CU	10. I think the amount of time I spend online is negatively impacting on important areas of my life.
IC	11. I would like to cut down the amount of time I spend online but it's difficult for me to do.
IC	12. I often try to spend less time online but find I cannot.

P=Preoccupation; W=Withdrawal; T=Tolerance; IC=Impaired Control; CU=Continued Use Despite Problems; LI=Loss of Interest in Other Activities; E=Escape/Relieve of Negative Emotions; X = no dimension

Appendix B
Items of measurement instruments classified according to suggested dimensions of Internet Use disorders

	Preoccupation	Withdrawal
CIUS	Do you think about the Internet, even when not online?	Do you feel restless, frustrated, or irritated when you cannot use the Internet?
	Do you look forward to your next Internet session?	
IAT	How often do you fear that life without the Internet would be boring, empty, and joyless?	Do you feel depressed, moody. Or nervous when you are off-line, which goes away once you are back on-line?
	Do you feel preoccupied with the Internet when off-line or fantasise about being on-line?	
	Do you find yourself anticipating when you go on-line again?	
IADQ	Do you feel preoccupied with the Internet (think about previous on-line activity or anticipate next on-line session)?	Do you feel restless, moody, depressed, or irritable when attempting to cut down or stop Internet use?
IRPS	When not connected, I find myself wondering what is happening on the Internet.	I feel anxious if I have not read my email or connected to the Internet for some time.
	When I haven't been able to connect for some time, I become preoccupied with the thought of connecting.	
	I have frequent dreams about the Internet.	
	When not on-line, I spend a lot of time doing other things related to the Internet (e.g. buying and reading Internet magazines and books, re-organizing files of downloaded materials, trying out new WWW browers).	
OCS	I often keep thinking about something I experienced online well after I have logged off.	I feel helpless when I don't have access to the Internet.
	When I am not online, I often think about the Internet.	
	I can't stop thinking about the internet.	
	I cannot see myself ever without the Internet for too long.	
	The Internet is an important part of my life.	
PIUQ	How often do you daydream about the Internet?	How often do you feel tense, irritated, or stressed if you cannot use the Internet for several days?
	How often do you dream about the Internet?	How often does it happen to you that you feel depressed, moody, or nervous when you are not on the Internet and these feelings stop once you are back online?
	How often do you fantasize about the Internet, or think about what it would be like to be online when you are not on the Internet?	How often do you feel tense, irritated, or stressed if you cannot use the Internet for as long as you want to?
GPIUS-2	When I haven’t been online for some time, I become preoccupied with the thought of going online.	
	I would feel lost if I was unable to go online.	
	I think obsessively about going online when I am offline.	
ISS	Ich beschäftige mich auch während der Zeit, in der ich nicht das Internet nutze, gedanklich sehr viel mit dem Internet.	Wenn ich längere Zeit nicht im Internet bin, werde ich unruhig und nervös.
	Meine Gedanken kreisen ständig um das Internet, auch wenn ich gar nicht im Netz bin.	Wenn ich nicht im Internet sein kann, bin ich gereizt und unzufrieden.
IDS-15		When I am not online I feel irritable, restless, anxious and/or frustrated.
		I feel sad if I am not able to go online.
		I tend to get anxious if I can't check what's happening online for any reason.
		I feel restless every time I am unable to go online.

	Tolerance	Impaired control
CIUS		Do you find it difficult to stop using the Internet when you are online?
		Do you continue to use the Internet despite your intention to stop?
		Do you think you should use the Internet less often?
		Have you unsuccessfully tried to spend less time on the Internet?
IAT		Do you try to cut down the amount of time you spend on-line and fail?
		Do you find yourself saying “Just a few more minutes” when on-line?
		Do you find that you stay on-line longer than you intended?
IADQ	Do you feel the need to use the Internet with increasing amounts of time in order to achieve satisfaction?	Have you repeatedly made unsuccessful efforts to control, cut back, or stop Internet use?
		Do you stay on-line longer than originally intended?
IRPS	The amount of information I get from the Internet is never enough.	I have tried to stop using the Internet for prolonged periods of time.
	The time I spend on-line has increased over the last 12 months.	I have tried unsuccessfully to cut down my amount of Internet use.
		I find myself connecting for longer periods of time than intended.
OCS		Even though there are times when I would like to, I can't cut down on my use of the Internet.
		My use of the Internet sometimes seems beyond my control.
		I never stay on longer than I had planned.
		I am bothered by my inability to stop using the Internet so much.
		I find that I go online more when I have something else I am supposed to do.
		I use the Internet more than I ought to.
PIUQ		How often do you realize saying when you are online, “just a couple of more minutes and I will stop”?
		How often does it happen to you that you wish to decrease the amount of time spent online but you do not succeed?
		How often do you feel that you should decrease the amount of time spent online?
GPIUS-2		I have difficulty controlling the amount of time I spend online.
		I find it difficult to control my Internet use.
		When offline, I have a hard time trying to resist the urge to go online.
ISS		Beim Internet-Surfen ertappe ich mich häufig dabei, daß ich sage: Nur noch ein paar Minuten, und dann kann ich doch nicht aufhören.
		Ich verbringe oft mehr Zeit im Internet, als ich mir vorgenommen habe.
		Ich habe schon häufiger vergeblich versucht, meine Zeit im Internet zu reduzieren.
		Mein Verlangen danach, mehr Zeit im Internet zu verbringen, hat sich im Vergleich zu früher ständig erhöht.
IDS-15		I would like to cut down the amount of time I spend online but it's difficult for me to do.
		I often try to spend less time online but find I cannot.
		I could easily stop spending time online if I wanted to without any problem.
		I can easily cut down the time I spend online any time that I want to.
		I am able to control and/or reduce the time I spend online.

	Continued use despite problems	Loss of interest
CIUS	Do others (e.g., partner, children, parents) say you should use the Internet less?	Do you prefer to use the Internet instead of spending time with others (e.g., partner, children, parents)?
	Are you short of sleep because of the Internet?	
	Do you rush through your (home) work in order to go on the Internet?	
	Do you neglect your daily obligations (work, school, or family life) because you prefer to go on the Internet?	
IAT	Do others in your life complain to you about theamount of time you spend on-line?	How often do you choose to spend more time online over going out with others?
	Do you neglect household chores to spend more time on-line?	
	Do you lose sleep due to late night log-ins?	
	Does your work suffer (e.g. postponing things, not meeting deadlines, etc.) because of the amount of time you spend on-line?	
	Does your job performance or productivity suffer because of the Internet?	
IADQ	Have you jeopardized or risked the loss of significant relationship, job, educational or career opportunity because of the internet?	
IRPS	There are times when I would rather use the net than deal with other pressing issues.	I have given up some of my social and leisure time so I can spend more time on the net.
	My friends and family complain about my use of the Internet.	
	I am often late for appointments because I'm on-line when I shouldn't be.	
	I have received phone bills I couldn't afford to pay.	
	My productivity at work (or school) has decreased as a direct result of the time I spend on the Internet.	
OCS	I often use the Internet to avoid doing unpleasant things.	
	People complain that I use the Internet too much.	
	When I am online I don't think about my responsibilities.	
	Using the Internet is a way to forget about the things I must do but don't really want to do.	
PIUQ	How often do you neglect household chores to spend more time online?	
	How often do you spend time online when you'd rather sleep?	
	How often do people in your life complain about spending too much time online?	
	How often do you think that you should ask for help in relation to your Internet use?	
	How often do you feel that your Internet usage causes problems for you?	
GPIUS-2	My internet use has made it difficult for me to manage my life.	
	I have missed social engagements or activities because of my Internet use.	
	My Internet use has created problems for me in my life.	
ISS	Mir wichtige Menschen sagen, daß ich mich zu meinen Ungunsten verändert habe, seitdem ich das Netz nutze.	Seitdem ich die Online-Welt entdeckt habe, unternehme ich weniger mit anderen.
	Seitdem ich das Internet nutze, haben sich einige Freunde von mir zurückgezogen.	Mein Alltag wird zunehmend stärker durch Internet-Aktivitäten bestimmt.
	Mir wichtige Menschen beschweren sich, daß ich zu viel Zeit im Netz verbringe.	
	Meine Leistungen in der Schule/im Beruf leiden unter meiner Internet-Nutzung.	
	Ich vernachlässige oft meine Pflichten, um mehr Zeit im Internet verbringen zu können.	
	Wegen des Internets verpasse ich manchmal wichtige Termine/Verabredungen.	
	Ich gebe mehr Geld für das Internet aus, als ich mir eigentlich leisten kann.	
	Ich bin so häufig und intensiv mit dem Internet beschäftigt, daß ich manchmal Probleme mit meinem Arbeitgeber oder in der Schule bekomme.	
IDS-15	I think the amount of time I spend online has jeopardized the relationship with my partner.	
	I think the amount of time I spend online is negatively impacting on important areas of my life.	

	Coping or mood modification	Missing dimensions
CIUS	Do you go on the Internet when you are feeling down?	Tolerance, (loss of interest)
	Do you use the Internet to escape from your sorrows or get relief from negative feelings?	
IAT	Do you block disturbing thoughts about your life with soothing thoughts of the Internet?	Loss of interest, tolerance, (escape/relief)
IADQ	Do you use the Internet as a way of escaping from problems or of relieving a dysphoric mood (e.g., feelings of helplessness, guilt, anxiety, depression)?	Loss of interest
IRPS	I have used the net to talk to others when I was feeling isolated.	
	I have used the net to make myself feel better when I was down.	
OCS	I get more respect online than "in real life".	Tolerance, loss of interests
	I feel safest when I am on the Internet.	
	I often find it peaceful to be online.	
	When I am online, I don't need to think about offline problems.	
	I am less lonely when I am online.	
PIUQ		Tolerance, Escape/relief
GPIUS2	I have used the Internet to talk with others when I was feeling isolated.	Withdrawal, tolerance, loss of interests
	I have used the Internet to make myself feel better when I was down.	
	I have used the Internet to make myself feel better when I've felt upset	
ISS		Escape/relief
IDS-15	I never go online to feel better.	Preoccupation, tolerance, loss of interest
	I think that being online can greatly change my mood for the better.	
	I go online to help me cope with any bad feelings I might have.	
	I go online to forget about whatever's bothering me.	