# Symptothermal Contraception with Smartphone Apps.
The comparison study of 2013 continued in 2014

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Abstract

In this comparative study, the most well-developed symptothermal apps were analysed in depth and evaluated according to 6 different criteria: 1) entry desk options, 2) cycle chart completeness, 3) user-friendliness and, most importantly, **4) the score of the *false positive* and *false negative days*[1] that measure the effectiveness of the interpretation program. For this reason, only interpreting apps were considered.** Two additional criteria were added to complete the comparison picture: 5) policies (security, guarantee, confidentiality and subscription conditions) and 6) pricing. There were two outstanding apps found: myNFP.de and sympto.org. They are both linked to an interactive homepage respectively and a competent counseling service. CycleProGo also links to these services but the vital criterion 4 is insufficient. The last app, LilyPro, neither has such links nor is its interpretation acceptable for natural contraception.

Grades of the different applications depending on the chosen criteria.

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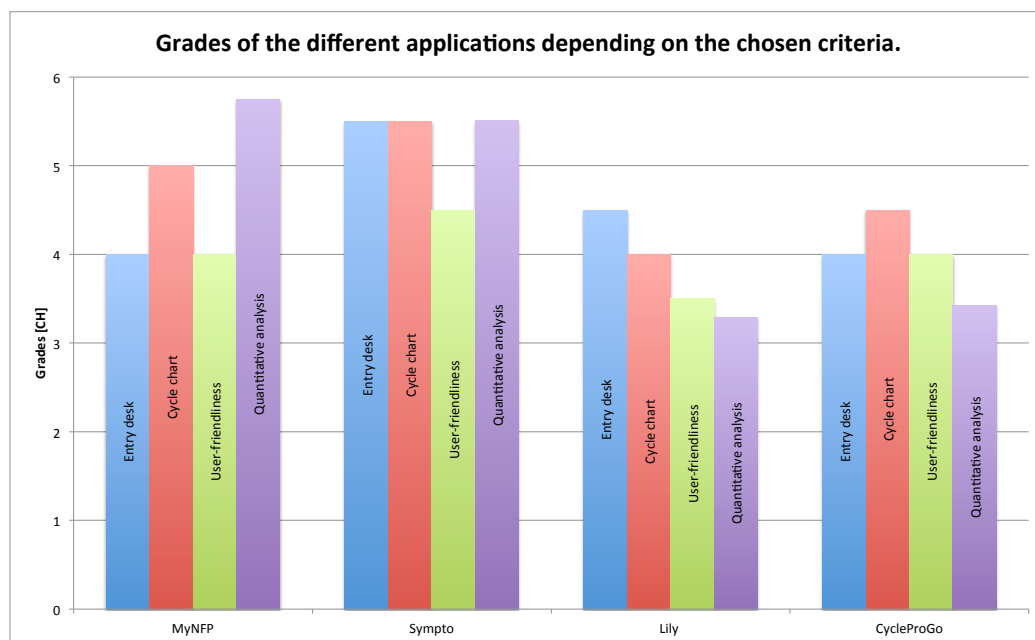
[1] This terminology was coined by Frank-Herrmann,P., Heil,J., Gnoth,C. et al (2007) The effectiveness of a fertility awareness based method to avoid pregnancy in relation to a couple's sexual behavior during the fertile time: a prospective longitudinal study. (this link is valid on sympto.org) Hum.Reprod., 22, 1310-1319.

German Abstract

In dieser zweiten App-Vergleichsstudie (die erste geschah 2013) wurden die besten symptothermalen Apps gründlich untersucht und aufgrund von 6 ausschlaggebenden Kriterien miteinander verglichen:

1) Möglichkeiten der Piloteingabetafel, 2) Vollständigkeit des Zyklusblatts, 3) Benutzerfreundlichkeit und nicht zuletzt das wichtigste Kriterium**: 4) Das Ergebnis der falsch positiven und falsch negativen Tage, durch welche die Zuverlässigkeit des Auswertungsprogramms bewertbar wird**. **Aus diesem Grund wurden nur Apps berücksichtigt, die symptothermal auswerten.** Zwei zusätzliche Kriterien runden die Untersuchung ab: 5) Geschäftspolitik (Systemsicherheit, Garantien, Vertraulichkeit, Anmeldebedingungen) und 6) Preispolitik. Ergebnis: Zwei Apps haben sich besonders ausgezeichnet: myNFP.de und sympto.org. Beide Apps sind mit einer interaktiven Homepage verlinkt und verfügen über einen kompetenten Beratungsservice, einen externen auf myNFP (bei nfp-sensiplan), einen externen und internen bei sympto. CycleProGo besitzt ebenfalls die hauseigene externe Beratung, doch scheitert die App am zentralen Kriterium 4. Die Kalifornische App LilyPro kann weder einen Beratungsdienst noch eine Synchronisation auf eine interaktive Web-Seite vorweisen. Zudem ist deren Auswertung ungenügend für die natürliche Verhütung.

French Abstract

Dans cette seconde étude comparative (la première eût lieu en 2013), les meilleures applications symptothermiques ont été examinées de manière approfondie et évaluées selon les 6 critères suivants :

1) Possibilités du tableau d'entrée (de pilotage), 2) possibilités du cyclogramme (la fiche graphique), 3) convivialité pour l'utilisatrice et, le plus important, 4) **le résultat des jours faux négatifs et faux positifs des interprétations respectives qui permet d'évaluer clairement la sécurité contraceptive de l'application: seulement les applications qui interprètent selon les critères symptothermiques ont été retenues**. Nous avons ajouté deux critères pour compléter le tableau: 5) Gestion générale (sécurité du système, garanties proposées, confidentialité, conditions d'inscription) et 6) politique de prix. En conclusion, deux applications sortent nettement du lot : myNFP.de et sympto.org. Les deux sont connectées à une page web interactive et en liaison avec un service compétent de consultation – externe pour myNFP, externe et interne pour sympto. CycleProGo dispose aussi d'un service externe mais échoue face au critère central 4. La dernière application, LiliPro, ne permet ni un travail web ni l'interaction avec une conseillère. Par ailleurs, en vertu du faible résultat du critère 4, cette application doit être écartée pour une contraception naturelle.

Introduction

The goal of this second study is to assist women in practicing natural contraception on their Smartphone. At the same time we wish to encourage App developers to improve the interpretation capacity of their programs. Empty apps like Kindara (USA) or iNFP (Germany, NFP-sensiplan) can be fashionable and good-looking but they are not up to the standard of modern cycle interpretation technology.

To better follow this second study, you are invited to read the summary of the study done in 2013, especially in order to understand the central issue of false positive and false negative days. We also recommend the *Complete Symptothermal Guide* for better fathom the advantages of an electronically interpreted symptothermal method.

The purpose of the first study, carried out in the summer 2013, was to find out whether there were any apps in the AppStore and Google Play that were able to indicate the fertile window as precisely as the best symptothermal method – executed by a competent user.

This first study compared the seven symptothermal applications that could be found in the AppStore and Google Play among some 100 fertility apps which were excluded from this study as they were not adapted for contraception. They were highly misleading and counter indicated for women seeking contraception. Owing to the general ignorance in this matter, women might have used them for this purpose and perpetuated the detrimental idea that natural contraception is not effective at all!

In the first study, the evaluation criteria were severely restricted; those that were mentioned but were not applied can be found in the annex of the first study of 2013 (in French only). Exclusively quantifiable criteria were retained at that time. Those were: the identification of false negative and false positive days compared to an ideal in which there would be no false negative and no false positive days per cycle. A false negative result displays an infertile day although the situation is clearly fertile or at least potentially fertile. A false positive result adds fertile days to the cycle, which are in reality non-fertile. False negative results lead to unwanted pregnancies, false positive results extend the time of abstinence or condom use: too many of these diminish the attractiveness and usefulness of the interpretation program.

There was a further limitation in the 2013 study: it focused exclusively on the transition from the fertile window into the post-ovulatory, infertile phase. 4 standard cycles and then 4 more that involved a greater complexity were analyed. The best results were found in sympto (AppStore and Google Play), followed by Lily (AppStore) and myNFP (AppStore), which outperformed other symptothermal applications, specifically for contraception. Except LilyPro, all the other apps have a site for online charting in addition to the app usage.

In this study, we will start again with sympto. But we chose real cases that were randomly taken from the sympto database. These will be compared to the three other

selected apps: myNFP.de, CyleProGo and LilyPro. **This time, the interpretation standard is the manual method, NFP-sensiplan, as this is the method with the most comprehensive scientific records. We will focus our efforts specifically on the beginning of the fertile window within the 3 complex scenarios that contain more than 13 cycles each. We will thus be able to compare the entire fertile window.**

Why more than 13 cycles? The main reason is that according to the NFP-sensiplan standards, only beginning in the 13th cycle can the system display more infertile days at the start of a cycle (in the preovulatory phase). This is possible as long as the conditions of the preceding 12 cycles justify this extension of the infertile preovulatory phase. In many scenarios, the 5 infertile preovulatory days are already cut because of one of the first 12 cycles. Following the 12th cycle, this shortened result remains throughout all observation years. There is no way back to more infertile preovulatory days. This is a requirement of the NFP-sensiplan standard that can be discussed. sympto has introduced another solution explained thereafter.

Technical and didactic transposition

By taking the classic NFP-sensiplan textbook *Natürlich und sicher* (1998, 2011, Trias-Verlag) as reference method for this study, we must be aware of the problematic issues of "technical and didactic transposition". The main problem is this: The original NFP-sensiplan school has not (yet) developed any interpretative app! We do not know what an NFP-sensiplan app would look like. We can only guess. Therefore we cannot subject the investigated apps to this kind of (hopefully) ideal app. We therefore have a methodological problem: Every app developer who explicitly refers to NFP-sensiplan, such as myNFP and LilyPro, should exactly disclose how they transformed the original method from manual to electronic. This transformation is called the 'didactic transposition', which refers to the content of the app. There is also a question of technical transposition. Sometimes new solutions pop up just by the fact that, what is manually impossible, is technically, and vice-versa. For example: When the manual user "puts into brackets" a disturbed temperature on her chart, the program can attenuate the (invalid) figure (myNFP) or cancel it altogether (sympto). In this case, myNFP is very elegant and closer to the manual way; on sympto, the cancelled temperature has to be added in brackets in the Remarks section! The all over elegance and user-friendliness is not a matter of one single detail: every user has to get used to the technicalities of the system. There is no way to avoid this learning process.

The CycleProGo is based on the traditional Couple to Couple League method; their main concern is to mould their own manual method into an app. Convinced that all the traditional, manual methods required some improvements we constructed sympto in a way which is not exactly a didactic transposition but a *synthesis* of NFP-sensiplan, INER-Rötzer and North West Family Services (unfortunately, their symptoPro app does not yet interpret data). sympto demonstrates to have solved, for example, some crucial problems of NFP-sensiplan and its manual *The Complete Symptothermal Guide,* combined with the sympto app, considers itself now as the state-of-art standard. Therefore, this study has a critical look also at Sensiplan. In the end, however, the app

results will be compared to the (manual) NFP-sensiplan standard and not to the state of art solutions proposed by sympto.

In the first study of 2013 we compared only the false positive and false negative results *at the end* of the fertile window. In this study, these false positive and false negative criteria were extended to the beginning of the fertile phase. But we must be aware that the false negative results in the beginning of the cycle do not have the same impact when they occur during the 12 crucial learning cycles. Later, after the learning period, beyond cycle 12, when the women is generally much more competent, these false negative days do not represent the same contraceptive risk anymore. On sympto, what counts is the shortest recorded Döring/Rötzer day *of the last 12 cycles* and not, as in NFP-sensiplan, the shortest of *the first 12 observed cycles*. In other words, on NFP-sensiplan the conviction is that the first 12 cycles are the ultimate criteria to determine the preovulatory infertile phase. In sympto however, the idea is that women become a) experts of their fertility pattern after 12 cycles and b) that if their Döring/Rötzer day enlarges the infertile preovulatory phase thanks to 12 cycles occurring after one or some years of observation, the system can liberate again more infertile preovulatory days. This enables them to manage more infertile preovulatory days, which are the exception anyway. In addition, for effectiveness reasons, this possible extension of the infertile phase is crosschecked daily by the possible occurrence of cervical fluid (called "elixir" in sympto).

As a general principle, whenever elixir or moistness is perceptible, fertility is immediately displayed. This basic rule has been successfully verified in all apps. Keep in mind: adding one or more infertile preovulatory days *for the expert user* does not create a risk of unwanted pregnancy as do any false negative days at the end of the fertile window when the couple (impatiently) waits for unprotected intercourses. Generally, this sympto extension is rated by the expert user as an enhancement. Every app must always keep an eye of its user friendliness in order to encourage couples to stick to the method more than just some months. This is the reason why, in this study, after the first 12 cycles, sympto displays some more preovulatory infertile days due to a subsequent 12 month calculus, which, compared to the (unnecessarily) stricter NFP-sensiplan penalizes sympto with some false negative days. Within a large user group, this issue is not paramount because most women have less infertile preovulatory days after the 12 learning cycles!

As announced above, this *objective or quantitative criterion* is only one of many that were examined: We will present a number of other criteria that we rated, but they are subjective and therefore based on evidence and facts. The goal was to give a more complete picture of the apps although the quantitative false positive/false negative day issue is the crucial point for their effectiveness. Our non-quantifiable criteria should be reviewed by an expert of didactic transpositions and by learning specialists, and not only by medical doctors! To avoid a new and rather difficult task, we have not rated the technical and didactic transpositions of the compared apps. We only show their strengths or even their improvements as compared to the original manual sensiplan method (yellow color), and weaknesses (green), as well as any errors (red).

Before we begin discussing the quality criteria of the examined apps, we will present the general features of every app. We include the reasons for our selections and eliminations.

Short presentation of the selected apps - The framework of didactic transposition

• **SymptoPlus** is a stand-alone Android application for the price of 16€ created by the Swiss SymptoTherm foundation in 2008, and updated in 2012. Three is also a free IOS/windows version, **sympto free.** Both provide 15 - 45 free trial days before the user can choose between different options (see detailed price list, chapter 6). sympto is directly linked to the sympto.org website where the user can enter her data in a more convenient way. The website boasts premium features designed for learning the method. A Complete Guide explaining all the details of the method and how the app works is freely available on the webpage. The printed version can be purchased on Amazon. Another advantage is that both, the website and the app, are available in several languages (French, English, German, Spanish, Polish, Russian and Bulgarian). The system allows the implementation of even more languages. There is also an internal message box that is unique to the sympto app. It allows the client to communicate directly with her counsellor. The counsellor has access to all clients' profiles and charts. This app targets all women: it can be used by teenagers and even women without partner for their empowerment, as they become body literate. The app is helpful furthermore for breastfeeding, pre-menopause, contraception, and conception purposes. *The goal of this app is to guarantee contraception when used properly. At this time, it is the only app that has tackled this challenge.*

Didactic transposition: This app is based on a combination of three leading well-known symptothermal methods (NFP-sensiplan, Rötzer/NWFS and Billings) and is designed also for newcomers. sympto is an eclectic synthesis of various methods and not a "high fidelity" didactic transposition of one specific method.

First we discuss the most salient points related to the NFP-sensiplan standard:
1) The start of the cycle cannot be triggered manually, except for the very first cycle. This constraint is unique to sympto: The reason behind this restriction is that we ask women to understand what constitutes true menses (starting a new cycle) as opposed to a mere bleeding episode (continuing the cycle). This differentiation is a must to increase effectiveness of any kind of such programs. Now, what happens after an extended observation break? Women understandably wish to start again with a new cycle on day 1 of their menses! There is now a technical problem on sympto: it always needs the infertile yellow phase in order to make possible a new cycle start. Therefore, when the cycle is in the blue fertile phase, the user cannot start a new cycle. She must apply a technical trick to bridge long phases of non-observed cycles and thus avoid resuming their observations at let's say on cycle day 857 of the cycle she stopped. myNFP proposes another solution we will meet hereafter.
2) A day with an observation of "nothing seen or touched" must be symbolised by a bar – : This icon confirms a *negative observation*. This special action is not explicitly required by the manual NFP-sensiplan/Rötzer methods but it is necessary in an interpreting program in order to increase its effectiveness. For

the manual methods, the situation of no observation can be either left empty or with a bar. On sympto we chose the necessity of the bar to express an action, on mynNFP for example, the emptiness without bar is accepted.

3) This bar is also required for 2 of the 4 Peak day (PD) combinations. sympto has coined a new synthesis for PD identifications which represents a novelty and is an improvement rather than an adaptation.

4) sympto has also introduced a new sign, the yellow cloud (or flower), in order to better characterise post-ovulatory mucus: this icon solves semantic problems of PD identifications, which became necessary during the test phase of 2006 – 2008 on sympto, 1st generation: it eliminates not all but most of the wrong PD! On sympto2 (the present version), there is a special PD management explained in the *Complete Symptothermal Guide*: This is typically a didactic translation, which not only simplifies but also clarifies.

5) The app was conceived to yield as many safeguards as possible. There are for example 8 different options in order to describe the elixir observation. These 8 options of specific elixir combinations are not exhaustive but they are meant for beginners to avoid wrong data combinations and misleading interpretations. An expert can deactivate these 8 default combinations and increase her combination possibilities. This is scheme is a major didactic transposition that constitutes a true symptothermal innovation.

6) Another example of NFP-sensiplan divergence is the "Da Vinci Code" on sympto. This code gives a clear combination setting for PD and temperature rise situations. This "Da Vinci Code" gate keeping combinations are a didactic transposition (and clarification) of the original Rötzer/NWFS method in which three correct rises *after PD* (the full red stars on sympto) are always required in order to close the fertile window. This requirement might add 1 false positive day from time to time compared to the NFP-sensiplan standard but this codification increases the effectiveness of the overall interpretation. In 1987, when NFP-sensiplan created their own system based on Rötzer, they abandoned this principle in order to make the still manual method more user-friendly: this didactic transposition and simplification was welcome at that time compared to the Rötzer system. But this manual simplification is not needed any more in a interpreting program which completes the whole calculations! Therefore sympto has come back to the Rötzer standard in this particular case.

7) Because of the Rötzer requirement of three correct rises after the PD (three stars), sympto allows the accumulation of two rise exceptions defined by Rötzer, whereas in NFP-sensiplan only 1 exception is tolerated, which, at that time, was meant to be another didactic transposition for simplifying and clarifying the Rötzer method. In other words, in NFP-sensiplan, if the rise cumulates the 2 Rötzer exceptions, the temperature line cannot be interpreted. But now, compared to the old Rötzer standard, we discover a paradox on NFP-sensiplan: A temperature rise with 2 successive exceptions will not be interpreted, *unless 1 of the disturbed temperatures is missing*! On sympto, a 2-exception situation is always interpreted because sympto does the Rötzerian move and waits for three higher temperatures (full stars) after the PD.

In our case studies we found several situations illustrating this point. These cycles are easily interpreted on sympto but refused on myNFP, which sticks closely to NFP-sensiplan in this regard. *We had to either modify the temperature*

rise slightly or delete the low disturbing temperature in order to enable this app to generate a sound interpretation.

8) Another distinguishing feature is found in the parameters for determining a cover line: sympto needs six days to find the cover line but with a minimum of only 4 temperatures. In other words: If there are 1 or 2 missing temperatures within 6 days, the rise will be calculated all the same from the remaining 4 temperatures. This is typically a methodical improvement of the bottom line rule, which helps women manage with fewer temperatures and have weekends without temperature takings. On myNFP, a missing temperature must be added before the six cover line days, which extends the cover line days to 7 or even more days! This move creates an major constraint especially in the beginning of the cycle: On sympto, the temperatures are taken from the first fertile day onwards; with the manual approach (and on myNFP), because of this constraint, the woman is invited to start temperature taking right at the begin of the new cycle!

9) On sympto temperature taking is monitored during the whole blue fertile days. Without such monitoring, a user would be required to take many more temperatures, also during the infertile yellow phase after ovulation, thus diminishing drastically user friendliness. There are no explicit indications for this requirement neither in the manual methods of *Natürlich und sicher* not on myNFP.

10) sympto has defined a minimum of 10 crucial pieces of information in order to interpret a cycle correctly: The beginning of the cycle which is triggered by the 3-red-drop icon, a minimum of 4 low temperatures within 6 days to establish the cover line, the peak day indication (2 signs), and the 3 correct high temperatures (displayed on *How does this work* page of sympto.org). myNFP follows an another scheme we will present below.

11) The Döring-Rötzer day, which is calculated from the first temperature rise per cycle (exactly as on NFP-sensiplan), must be clearly visible. The system must register these days and compute the earliest, the big, Döring-Rötzer day. *This is the main criterion to test in this study!*

12) Language options: does the app offer one or two languages (CyleProGo, English and Spanish), or can new languages be added (sympto, 8 languages now) for women all over the world?

13) The program is able to integrate a default temperature-only interpretation when the PD is missing. It can also be switched to a non-temperature, elixir-only mode (Billings mode).

These salient features define some of the **state-of-the-art solutions that should be implemented in every app nowadays**. In addition to the didactic transposition problem there is the question of whether this transposition (or in case of sympto – synthesis) is clearly explained in the documents enclosed with the app. In case of sympto, you can find the details in the manual *The Complete Symptothermal Guide*. On October 15th, 2014, sympto has become an **open source project** in order to disclose all of its knowledge.

• **myNFP** is a German stand-alone app (on IOS only; for 5.49 E) which was created in 2010. The Internet version was developed in 2006 already, some months later than sympto1! It aims to be an exact electronic transposition of the manual NFP-sensiplan method, which was created in the eighties (with *Natürlich und sicher*, its famous

manual). The Android version only has an entry desk and no proper stand-alone functions. It costs 2€ monthly for premium access that is set up cleverly: with the expiry of the Web access, the app becomes blocked. Thus the initial app payment is subject to the renewal of the premium web usage! The main advantage with myNFP is that it manages a very elaborate and comprehensive website including a substantial user community. The app can be used in either German or in English; however the website is only in German. The method is explained briefly but for further information the user is encouraged to join NFP-sensiplan teaching classes, and to study the manual *Natürlich und sicher*. The app is mainly designed for women who already have some NFP-sensiplan experience. *For legal fears mainly, myNFP does not endorse any guarantees for natural contraception even when used properly. This app aims to present a perfect interpretation but does not compete openly with hormonal contraception. On myNFP, women can turn off the automatic interpretation if they want to rely on their own interpretation skills. This option was implemented to satisfy those women who believe that "no program is capable to interpret correctly", at least not as well as they pretend to do. If you belong to this group of women, please read the Introduction of sympto's* **Complete Symptothermal Guide** *where this argument is refuted. This fallacy is the pretext that keeps NFP-sensiplan from creating an interpreting app!*

Didactic transposition. At first glance, myNFP is fully compatible with its manual origin *Natürlich und sicher* and the *Exercise book (Arbeitsheft).* Indeed, a woman can open "new catalogues" of cycles (Zykluskatalog anlegen), even in the future, when no real observation is possible. (We did not rate this peculiar, wrong and misleading possibility.) This "new catalogue", which is the practical means for myNFP to overcome time gaps, does not start at the original cycle 1 from scratch: it recalls data from prior cycle catalogues such as the Döring-Rötzer day. This is exactly what NFP-sensiplan requires. The same holds for the ovulation safeguard of the previous cycle: A woman who resumes her observations after some "empty" months or years can easily start a new cycle, crating a new catalogue, and according to the NFP/Rötzer safety rules, this first cycle must start again with (possibly) fertile days. In the second cycle of this new catalogue, it resumes the old Döring-Rötzer value and displays the preovulatory infertile days. But with a new catalogue you can never change the old Doring-Rötzer day in a new catalogue!

The bar that symbolizes "no observations", which was introduced initially by myNFP in 2006, was eliminated in order to allow women to enter less data. It is not clear whether this is compatible with NFP-sensiplan. Another point however is clear: The peak day identification of myNFP does not follow at all the NFP-sensiplan rules but adapts the method to technical possibilities. How that?

On myNFP, you can trigger a peak day (PD) by the symbol **f**, *feucht*, which means moist, followed by nothing the day after! There is no explicit indication of the PD. The main reason is that myNFP – as it does not interpret temperatures only charts – requires a kind of rudimentary PD in order to interpret the temperature rise.

Another point where an NFP-sensiplan problem is not solved but perpetuated is this: when two (Rötzer) temperature exceptions follow each other and block the interpretation, one can remove the disturbing temperature of this sequence and the myNFP program will then interpret correctly. There we have the paradox of a system accepting the banned double exception with less information!

myNFP has been very faithful in its calculation of the cover line: when a temperature is missing, the system asks for an additional 6th temperature before the six days preceding

the first temperature rise. In this respect the transposition is perfect. But this move adds irrelevant information. To sum up: myNFP can interpret the female cycle with a minimum of 11 data entries: 1) start of cycle, 2) six lower temperatures, 3) 3 higher temperatures and 4) Peak day. We don't know if myNFP is as effective as sympto. These two apps would benefit from in-depth comparative analysis. The didactic transposition in myNFP is visible and well-explained. In myNFP, the user can activate the explanatory logs below the cycle chart. There are plenty of explanations about the method available on the website presumably making *Natürlich and sicher* some day redundant!

• The **LilyPro** stand-alone app is available on IOS only; the California-based programming company Whimsical created it in 2012. It claims to analyse the data entered applying NFP-sensiplan rules as well as the Fertility Awareness Method (FAM by Toni Weschler). A free e-book manual is available explaining the main features of the method and the app functions. However the website can only be used for information support and app explanations, no data can be entered directly onto the webpage and synchronized. One main advantage is that this app costs 5.49€ for unlimited use. No counselling or courses are available; thereby this method is targeting women who already know this method but don't necessarily need to be experts in this field. This app has a very attractive, colourful presentation and has a consistent entry table. *It does not guarantee contraception for legal reasons although this purpose is explicitly mentioned.*

Didactic transposition: This app offers two kinds of interpretation, NFP-sensiplan and Toni Weschler's system. We discovered that all American systems (except the NWFS, symptoPro) need a 4th day after Peak identification even if the temperature rise complies with the Rötzer/NFP-sensiplan standards. There is a conflict of systems right from the start. At closer examination we realised that the NFP-sensiplan rules have not been implemented but some other, similar rules have: for example, the base line does not run through the highest lower temperature but is placed at 1°F above! The PD is indirectly visible as a colour (indicating highest fertility) but not explicitly indicated as an icon on the chart. Since the didactic transposition is unsatisfactory, the question of its visibility becomes irrelevant.

• **CycleProGo** is an app created by the Couple to Couple League in 2013 (its latest version) and is based on their traditional method. Anyone can download the app free-of-charge for a 90-day trial. Afterwards the user has to pay subscription rates (either annually, monthly, or quarterly). CycleProGo have a very complete and complex website with a wide range of options. There is no real counselling contact available on the website (except an email address). But as this method is widely used in Catholic circles, women are advised to contact couples using the same method. Thereby this app is mainly targeting couples who already know the manual of CCL. For any information about the method you will be redirected to the CCL website and community. In the previous study carried out a year ago, this app had troubles analysing basic cycle scenarios; some updates have been done and a newer version of this application is available and was tested in this study. *The goal of this app* is *to enhance the charting for women but not to give an accurate interpretation. This app is therefore not at all suited for natural contraception. We analysed it all the same as they represent the leader of NFP organisations.*

Didactic transposition: This system aims to present the manual CCL method but it does not claim to have succeeded in this venture. They say: « Note that while CycleProGo is based upon CCL's rules, some automatic interpretations are more conservative in order to encourage couples with atypical cycles to reach out to qualified teachers for one-on-one consult. Thus there are potential cycles where the automatic interpretation may slightly extend the fertile phase, or may not calculate the infertile phase. *This choice is deliberate to encourage couples to seek support from certified teachers (italics HW).* » We do not question the importance of encouraging couples to learn the method properly with a certified teacher. But telling you to take a counselor because the program is not reliable appears to be an excuse for not having succeeded in programming a good app. We hope that this program will improve with time. May be there is also this fallacy of telling women that technology is not a really good thing for cycle observation (see above)!

This passage from the textbook to the program informs us of a lack of transparency: « However, the way that Peak Day, our NFP rules and other method-related algorithms are programmed into CycleProGo, this information is part of CCL's intellectual property, which cannot be disclosed»!

• **LadyCycle** is also an NFP-sensiplan-based app, but it was not selected for testing even though it has an intriguing entry board and is a stand-alone app. Only very little information can be seen on the cycle charts, the vital data entered is mainly visible on the calendar. We also met serious interpretation problems in some easy standard examples. Moreover, this app doesn't have any web access. However, one laudable point is that the method is explained in great detail directly in the app. It also offers a large space to note your psychological and emotional state.

• **Kindara** is a trendy American app which does not interpret data yet: We wanted to find out whether the entry desk was complete: Unfortunately, we realised that on Kindara no sensation/feeling of the elixir could be added, the only choices of adjectives relating to the mucus were about the appearance (visible and tangible) data. Otherwise, it has a fully developed entry board and a very good support system (very quick, clear and big community). The app is linked to a website. However, you can only see your data but not enter it there. As we decided to observe how the different apps analyse an identical set of data, this app was not suitable for our purpose.

The three cycles scenarios: short description

1. The first case is an American woman who has entered 14 cycles, from August 18, 2011 through November 2012. Her longest cycle is 29 days and her shortest is 25 days. Notably, she had never had any counselling. She is a free user and works only with her App.
This woman combines temperature, elixir observation (sensation and appearance) and cervix examination. sympto manages the combination of elixir and cervix observations in its particular way. myNFP/Sensiplan do not combine both. Lily and CycleProGo do not

interpret cervix observations. Therefore, the analysis of this case was a real challenge. This issue is also largely discussed in sympto's *The Complete Symptothermal Guide*, p. 86. Her aim is to use the symptothermal method as a means of contraception.

The first cycle is very long (110 days). This is due to the fact that she is in breastfeeding mode: she has menstruations around the 36-39th day but as her cycle is in the breastfeeding mode, which does not indicate ovulation, she receives (preovulatory) pink infertile on day 34 and 35. All the other apps can interpret the rise normally; they show 2 cycles for this long cycle. (By deactivating the premenopause mode, sympto will react in the same way.)

The interesting fact in those cycles is that she has a normal pink phase (i.e. five days of pre-ovulatory infertile phase) up to cycle 11. In cycle 11 ovulation occurs very early (around day 8) and, as a consequence, the Döring day is shifted towards the beginning of the cycle. This shift results in only 1 infertile preovulatory day (pink phase) from here on.

This case is noteworthy: it shows how the Döring/Rötzer day (indicating the opening of the fertile window according to the temperature) restricts the infertile days when the temperature rise takes place early in the cycle.

In order for myNFP to compute the coverline we had to add a fifth and a sixth temperatures (36.1°C) at the beginning of cycle 11 (on days 3 and 4). In sympto this is not necessary. We observed that Lily and CycleProGo have trouble analysing cycles when only cervix positions are entered. On myNFP in order for the program to analyse the cycles without elixir we must change the setting from "Temperatur + Schleim" (temperature + elixir) "Temperatur + Muttermund" (temperature+ cervix), indicating an analysis based only on temperature and cervix observation. In sympto's state-of-the-art program, this dichotomy was eliminated by a genuine new solution that allows combining cervix check and elixir manifestations.

2. Our second case of interest contains 33 cycles (we analyzed 15) starting in November 2011 and ending around August 2014. The shortest cycle lasted 25 days and the range of variance was 33 days. This Swiss woman had basic symptothermal instruction with a sympto counsellor but she did not follow up and used the app all alone. When we chose this example we made some slight modifications of the raw data.

For instance, we had to make a change on day 12 of cycle 1: we added an elixir sign in order to make a Peak Day appear. This change was driven by the fact that without any PD myNFP and Lily could not detect a temperature rise: sympto can as default solution, and in CycleProGo this mode has to be activated manually. We also added some temperatures at the beginning of each cycle starting at cycle 15 to 19 in order to enable myNFP to calculate the coverline, always based on 6 temperatures (not 4 to 6 as on sympto).

This cycle is interesting as it includes an intermenstrual bleeding at cycle 4, but also because it shows how the PD can be shifted if no high temperatures appear soon after it and if mucus observations are introduced (as in cycle 3 and cycle 10). Moreover, it is fascinating to examine how each app computes the opening of the fertile window. In this case we can observe two potential shifts of the Döring-Rötzer day: one from day 6 to day 8 (leaving 5 and 7 pre-ovulatory infertile days at cycle 13), and another one at cycle 14 where the infertile phase shifts from day 7 to day 8. However, this double shift of the opening of the fertile window, based on the last 12 cycles, can only be observed in sympto. myNFP strictly follows the NFP sensiplan rules which require that only 1

increase in number of infertile preovulatory days can be allowed for each woman, based on the first 12 observed cycles, the result of which will never change in future. This restricted NFP-sensiplan standard creates in sympto some rare false negative days here. However, they are not fateful as they occur the beginning of an extended preovulatory infertile phase. For this reason, the calculus slightly lowered the coefficient for sympto in this case.

3. The third case comes from a woman who has entered 17 cycles, (from the 22nd February 2013 up to August 2014) but we only analyzed 15 of them. The longest cycle is 35 days long and the shortest one counts 28 days; moreover she never had any counselling.

This woman observes her elixir (sensation and appearance) and takes her temperatures. The first cycle was slightly modified in order to correspond to NFP-sensiplan rules, which reject the accumulation of two temperature-rise exceptions. The temperature on day 26 was changed from 36.45 °C to 36.5 °C; we could have just deleted this value to trigger the electronic interpretation. She has a standard pre-ovulatory infertile phase (i.e. 5 days) from cycle 2 through cycle 12. Starting from cycle 13 she has more pre-ovulatory infertile days: the length of this phase increases from 5 to 7 days. This is because in her twelve previous cycles her temperature rise came relatively late in her cycles and so her Döring-Rötzer day shifted. Especially interesting is cycle 15: she loses here 1 pre-ovulatory infertile day on the 7th day of the cycle because of the introduction of a fertile symbol (the clear, tacky elixir appearance). This principle of "any fertile sign opens the fertile window" is generally respected in all apps. Another change we made was in cycle 6: the temperature on day 10 was put into brackets. This move enables the detection of a temperature rise: initially the woman had set her parameters in sympto to Billings mode. We turned off the Billings mode in order for the other programs to interpret this case.

For both cycles, 8 and 9, 1 temperature was "put into brackets" (i.e. disregarded) respectively on day 14th and day 24th. In cycle 8 the management of the temperature rise with the two disturbed days is instructive in myNFP as it shows again this incoherence of the banned double exception, which is however accepted if one cancels the fatal low temperature. As there were several similar cases in these randomly chosen cycle sequences, it would be illuminating to check other examples in order to confirm the hypothesis that this banned double exception is rather frequent and should therefore be abandoned in the NFP-sensiplan standard.

Criteria

At the core of this paper, we embedded a comprehensive fertile window examination into a larger context of other criteria highlighted by organizations such as warentest.de, and an American discussion group on the website[2].

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[2] http://www.fmec.net/fertility.htm

This group intends to make their own comparison study and they propose the following criteria but the content and exact meaning of these criteria are not yet known:
Authoritativeness
Accuracy #1 (method effectiveness)
Accuracy #2 (observation accuracy)
Support
Adaptability
Pricing
Ease of Use
Confidentiality
Developer / Sponsor
Platform
A German self declared "expert" woman on   http://trainyabrain-blog.com/ uses the following aritrary criteria to rate an app:

- *Dateneingabe/-ausgabe: Easiness to enter data*

- *Schnelleingabe: Short cut entry possibility*

- *Ausgabe des Zyklus als pdf: pdf edition of chart*

- *Passwortschutz: password protection*

- *Usability/Nutzerfreundlichkeit: user friendlyness*

- *Design: design*

- *Datenbackup: back up for the standalone app*

- *letzte Aktualisierung: last update*

This kind of self-made criteria is very popular on youtube and blog presentations where the common user fakes the (not so brilliant but nevertheless devastating) expert. There is this general app rating fashion where clients judge the app in 10 seconds. This particularly bad habit is detrimental for the symptothermal method, as it does not respect any serious criteria catalogue.
Unfortunately, there is at this moment no consensus about the criteria; the exact content and range of these American criteria are not yet finalized.
Warentest.de proposes the following criteria catalogue:
   A) Content of the app: the software that is integrated; its conception and references, etc. What features are necessary to register all the salient symptothermal information? Etc.
   B) User friendliness: is there a web site for the charting or is the charting possible only on the app? Is it a Web app or a standalone with a sync function? Are there educational tools and is there a counseling service? Technical support, community. Pricing policy. Etc.
   C) Confidentiality and transparency: Is there a legal reminder, which guarantees confidentiality and the quality of the services? Who is behind the App?

On the comparisons charts, the green color signifies a disadvantage or clumsiness, the red stands for errors and the yellow for innovative brilliant solutions. This kind of enhancement should guide the reader for his understanding.

We do not resume the criteria discussion we developed in the 2013 paper; there were more than thirty! We chose the pragmatic way: our criteria were set according to the basic app features and functionalities examined. In a first step, we analyzed the

1) Entry desk (pilot desk board):

Does it permit all the different entries needed for the method? Does it help the user coordinate her activities? The idea of sympto (creating a real pilot desk) has been copied to a large extend by the other developers although less consistently. This rating was done by the three experts and authors of the study but it can and should be discussed by anyone who has read and seen the comparison tables hereafter.

2) Cycle chart:

Is the cycle chart complete? Do you see all the relevant items such as the cycle day, the calendar date, etc. Is there space for personal remarks, can you use the cycle chart also for manual use, i.e. your own interpretation, etc.?

Again, this rating was done by the three experts and authors of the study but it can and should be discussed by anyone who has read and seen the comparison tables.

3) User-friendliness:

This point combines different aspects you are confronted with when using an app: Is there any personal help? Is there a forum/blog? Are there educational help messages in the app or just tutorials sent out as emails?

Again, this rating was done by the three experts and authors of the study but it can and should be discussed by anyone who has read and seen the comparison tables.

and finally, most importantly,

4) The identification of false positive and false negative days. In 2 tables we present the figures of the 3 case studies. The rating for this point was assigned using a specific formula.

We developed a spreadsheet to display and compare these 4 different criteria which are summed up in a diagram (see also abstract).

In point 5, we analyzed the following criteria of each app:

Security, guarantee, confidentiality and subscription conditions

and, last but not least, in point 6, pricing.

1) Entry desk completeness A

criteria / apps	Sympto	LadyCycle	myNFP
Icons			
	On entry desk + cycle charts	On calendar	On cycle charts only, not on entry desk
Bleeding			
Menstruations	Nothing	No bleeding	Nothing
	1 Red drop, light bleeding	Light	Light
	2 Red drops: medium bleeding	Medium	Medium
		Strong	
	3 Red drops: strong	Very strong	Strong
Spotting	1 Red drop	Light	
		Medium	Spotting
		Strong	
		Very strong	
Intermenstrual bleeding	Variable 1 - 3 drops	Light	
		Medium	Variable
		Strong	
		Very strong	
Cervical mucus		No clear distinction between appearance and sensation	No clear distinction between appearance and sensation
Sensation	Yellow sun = dry	Dry	t = trocken, dry
	Nothing seen = not icon, nothing	No feeling	∅ "nothing seen and nothing felt"
	Blue drop = moist	Moist	f = feucht, moist
	Wave: lubricant, wet	Wet	S+ = sehr fruchtbarer Schleim (very fertile mucus)
Appearance	Bar = nothing seen	Nothing can be seen	∅ "nothing seen **and** nothing felt"
	Small blue stick=cloudy, thick, milky or creamy	Pudgey, creamy, yellowish, sticky, not elastic	S = Schleim (mucus)
	Yellow cloud=yellow or yellowish elixir		(S+) or (S) to adjust a Peak day[1]
	Big blue stick= clear, slippery, raw egg white	Glassy, like egg white, elastic, liquid, transparent	S+,S+ = sehr fruchtbarer Schleim
Cervix position			
Position, opening, firmness	Low cervix, hard, closed	Low	Soft and closed (contradiction?)
		Closed	Hard and closed
		Hard	Low
	Medium cervix, half open	Middle	Soft and slightly open
		Sligthly open	Hard and sligthly open (contradiction?)
		Mildly firm	Middle
	High cervix, soft	High	Hard and open (contradiction ?)
		Open	High
		Soft	Soft and open
Temperature			
Ways of temperature measursment	Oral	Oral	No indication
	Rectal	Rectal	
	Vaginal	Vaginal	
		Aural	
		Other	
Preselected temperature interferences	13	10 (alcohol, medication,party, stress…)	23 (too many?)
Automatic filling of the time	Possible	No	No
Precision	Up to 0.05 **(automatic rounding)**	Up to 0.05 (automatic rounding)	Up to 0.05 (manual rounding)
Taking off wrong temperatures or elixir	Possible	(Possible)	Possible
Choice °C/°F	Yes	Yes	Yes
Psychologic second panel			
	None, but lunar calendar on symptoPLUS app	Yes	No
	Mood (has 3 different icons)	1) Mood	Indicate mean of contraception
	Can add daily remarks	2) Stress level	Can add remarks
	Medically relevant infos on the profile (kg,cm, age, etc.)	3) Libido	Can add new lists of remarks
		4) Pain (head/stomach/backache)	
		5) Digestive pb	
		6) Psychological symptoms	
SI : Sexual intercourse			
	Protected	Protected	Protected
	Unprotected	Unprotected	Unprotected
		No SI	
Languages available			
	French (web+app)	English (app+web)	German (web+app), website is only in German
	English (web+app)	German (web)	English (app)
	Italian (web+app)		
	Polish (web+app)		
	German (web+app)		
	Spanish (web + app)		
	Russian (app and some web)		
	Bulgarian (app and some web)		
Cycle and observation goals			
	Contraception	Conception	No contraception
	Conception + pregnancy cycle	Contraception	
	Observation	Pregnancy	
	I accept what comes	Observation	
	Pre-menopause		
	Breastfeeding		
Catalogues of cycles	No	No	Yes
Manual			
	Own manual, electronic and paper version	Nat. Familienplanung, E. Raith, 2008	Natürlich und sicher
	French, English, German, Italian, Spanish		
Incorporated methods			
	NFP-sensiplan	NFP-sensiplan	NFP-sensiplan
	Rötzer		
	Billings		

Legend

errors in the developping	Remarks	Remarks
interesting ideas/ advantages	1-no real dates on cycles only days of the cycle	[1] Retroactive modification of the peakday
drawbacks	2-half tenth of degres not taken into account	but can be applied on the today 's data !!!
	3-no pre-ovulatory infertile phase	
	4-hard to enter a lot of data	

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1) Entry desk completeness B

criteria / apps		Lily	CycleProGo	Kindara
Icons				
		On entry desk	On cycle charts	On cycle charts
Bleeding				
Menstruations		Nothing	Nothing	Nothing
		Light	Light flow (/)	Light
		Medium		Medium
		Strong	Heavy flow (×)	Heavy
Spotting		**Spotting**	Spotting (●)	Spotting
Intermenstrual bleeding		Variable	Variable	Variable
Cervical mucus			No clear distinction between appearance and sensation	
Sensation		Dry, itchy uncomfortable	Dry (d)	No sensation
		Nothing	N/A or obscured	
		Cold moist	Moist (m)	
			Wet (w)	
		Wet, slippery, lube like	Slippery (sl)	
			Wet, slippery (w,sl)	
Appearance		Nothing	Nothing (n)	None
		Milky,creamy, non stretchy	Tacky (t)	Creamy (little/medium/lots)
		Rubbery, semi-translucent,cloggy/sticky		Sticky (little/medium/lots)
		Spinnberkeit,opaque streak, eggwhite,liquid	Strectchy (s)	Eggwhite(little/medium/lots) watery (little/medium/lots)
Cervix position				
				Low
		Firm, low, closed	Closed	Closed
			Hard (h)	Firm
				Medium
		Middle, partly open	Open least	Medium
				Medium
				High
		Soft, high, open, wet	Open	Open
			Most open	
			Soft (so)	Soft
Temperature				
Ways of temperature measursment		No indication	Oral	No indication
			Vaginal	
Preselected temperature interferences		20	None	None
Automatic filling of the time		No	No indication of the time !!!!(on the app)	No
Precision		Up to 0.05 (manual rounding)	Up to 0.05 (manual rounding)	Up to 0.05 (manual rounding)
Taking off wrong temperatures or elixir		Possible	Possible	Possible
Choice °C/°F		Yes	Yes	Yes
Psychologic second panel				
		Yes	Yes 4 different panels	None but can be created
		1) Secondary symptoms =>15	1) Can add notes	
		2) Moods =>28	2) Weight/heigth	
		3) Space of pregnancy/LH test	3) Ovulation tests	
		4) Cramps during period (mild/moderate/severe)	4) 22 moods or information on daily events	
		5) Nausea (mild/moderate/severe)		
		6) Vomiting		
SI : Sexual intercourse				
		Protected	Only yes or no	protected
		Unprotected		unprotected
Languages available				
		English (web+app)	English (web+app)	English (web+app)
		German (web+app)		
Cycle and observation goals				
		Menopause	Pregnancy	Pregnancy
		Observation	Observation	Fertility awareness
				Track periods
Catalogues of cycles		No	No	No
Manual				
		Natürlich und sicher	Own manuals, own educational classes	Electronic manual parts integrated into the app
		manula vailable in English and German		T. Weschler Taking Charge of your fertility
Incorporated methods				
		NFP-sensiplan and Toni Weschler	CCL	No analysis of the data

Legend

errors in the developping	Remarks	Remarks
interesting ideas/ advantages	1-has an attractive entry board	can choose the criteria to te detect the different phases
drawbacks	2-can export pdf	
	3-easy to enter a lot of data	
	4-pregnancy detected after 18 high days	

2) Cycle chart possibilities A

criteria / apps	Sympto	LadyCycle	myNFP
Icons visible on cycle chart			
Bleeding	Menstruation	/On calendar	Menstruation
	Spotting	/On calendar	Spotting
Cervical mucus	Sensation	/On graph below	Sensation
	Appearance	/On graph below	Appearance
Cervix position/opening/firmness	Yes	/On graph below	Yes
Time indication of temperature	Yes	No	Yes
Temperatures	Yes	Yes	Yes
Structure of date indications	Yes + weekend indication	No	Yes
Cycle day	Yes	No	Yes
Chart also for manual use	Yes	No	Yes
Secondary symptom indications	Mood and Middleschmerz	/	Moods+pain+medications
	Breast examination asked at day 6		
Remarks	Yes	No	Yes
Programs	Billings mode	ST	ST
	ST and temperature alone		
	Premenopause		
	Breastfeeding		
Statistics	Length of the shortest cycle	/ On another page	/On another page [1]
	Average length change from the cycles		Prevision of next menstruation
Beginning of fertile window	Big (modifiable) and small Rötzer	/	/
Cycle phases	Pre-ovulatory infertile phase (pink)[2]	Infertile phase (green)	Pre-ovulatory infertile phase (green)[2]
	Post-ovulatory infertile phase (yellow)		Post-ovulatory infertile phase (green)
	Fertile phase (light blue)	Fertile phase (purple)	Fertile phase (white)
	Very fertile phase (dark blue)	Highly fertile phase (pink)	Very fertile phase (orange)
Sexual intercourse	Protected	/on calendar	Protected
	Unprotected		Unprotected
Temperature baseline	Yes	Yes	Yes
Predictions	None	Next menstruations	Next menstruations
		Predicted ovulation day	
		Next infertile phase (dark green)	
Current day	Highlighted in green	In blue	Nothing special
Ovulation day	No	Estimated ovulation day	No
	Yes	No	Not exactly (1.hM)=> 1st higher T°
Start of a new cycle			
	Can't be started manually	Starts always manually	Starts always manually
	Starts with 3 red drops in yellow phase		with catalogues for series
	Except first cycle		
Debug mode	For counselors only	/	For users !

[1] this app has a very complete statistic page
[2] not on 1st cycle
[3] this phase was considered as indicating infertility
[4] peakday only detected using standard ST mode

2) Cycle chart possibilities B

criteria / apps	Lily	CycleProGo	Kindara
Icons visible on cycle chart			
Bleeding	Menstruation	Menstruation	Menstruation
	Spotting	Spotting	Spotting
Cervical mucus	Sensation	Sensation	Elixir observation (mix of both)
	Appearance	Appearance	
Cervix position/opening/firmness	Yes	Yes	Yes
Time indication of temperature	No	No	??
Temperatures	Yes	Yes	Yes
Structure of date indications	No, only on calendar	Yes	Yes (+ day of the week)
Cycle day	Yes (every five day)	Yes	Yes
Chart also for manual use	No	Yes	No
Secondary symptom indications	Yes+moods+medication+ LH/prg. Test	Only breast examination	The ones added personally
Remarks	Yes	Yes	Yes
Programs	ST	ST	No interpretation
	/	Temperature only	
	Premenopause	Billings - mucus	
	/		
Statistics	Prevision of next menstruation	None	Prevision of next menstruation
Beginning of fertile window	/	Different choices	/
Cycle phases	Infertile phase (blue)[2]	Phase I [2]	No phase indication
		Phase III (not explained)	
	Fertile phase (pink)	Phase II	
	Very fertile phase (purple)	Phase unknown (between I and II) [3]	
Sexual intercourse	Protected	Yes	Protected
	Unprotected	No	Unprotected
Temperature baseline	Yes	Yes, plus line for higher temps	Manually
Predictions	None	None	None (as no analysis)
Current day	Last day appearing on the chart	Last day appearing on the cycle chart	/
Ovulation day	No	No	No
Appearance of PD on the cycle			
	Yes the exlixir appears in light blue	Yes (P) [4]	Can be added manually
Start of a new cycle			
	Starts always manually	Starts always manually	Can be started manually
	can be edited on chart (cycle divider)		
Debug mode	/	/	/

[1] this app has a very complete statistic page

[2] not on 1st cycle

[3] this phase was considered as indicating infertility

[4] peakday only detected using standard ST mode

3) User-friendliness

criteria / apps	Sympto	LadyCycle	myNFP
App is web site linked			
	Yes sympto.org	No->ladycycle.com	Yes-> mynfp.de
Pricing of the apps (summary)			
	iPhone/Windows: free; Android 16 E	Completely free app but you can make a donation	App 5.49€ (once) linked with 2E/month Web use
FAQ			
	29	9	15
Community			
	Blog	Blog	Blog
	Forum on facebook and twitter	?	Forum
Communication /tech support			
	Personal message box	Not on app	By email
	Personal counselling available	By email	External teaching + counseling available
			Forum
Educational messages			
	Daily help messages on chart and entry desk	None	None
Error messages when entry incoherent			
	Yes	No	No
Calendar			
	Only on sympto plus (android)	Yes	Yes
Password protection			
	Yes on sympto plus (android)		Yes
Design			
	Attractive (sympto free, IOS) very attractive (sympto plus, android)	Attractive	attractive
Bugs			
	No	No	No

criteria / apps	Lily	CycleProGo	Kindara
App is web site linked			
	No ->whimsicallily.com/lilypro/en	Yes->cycleprogo.com	No-> app.kindara.com
Pricing of the apps (summary)			
	App 5.49€ then no other payement needed	App free but linked to Web access 5 $ /month	Free app and free account
FAQ			
	28	27	/
Community			
	/	CCL community	Blog
		Forum	Testimonials
Communication /tech support			
	Not on app	Email counseling	Can send a request
	By email	Teaching by same organisation	Forum
Educational messages			
	None	None	None
Error messages when entry incoherent			
	No	No	No
Calendar			
	Yes	Yes	Yes
Password protection			
	Yes	Yes	Yes
Design			
	Very attractive	Basic	Very attractive
Bugs			
	Yes	No	No

4 A: Quantitative analysis

	NFP sensiplan (reference method)	MyNFP	Sympto	Lily	CycleProGo	total =
number of cycle analysed						
test cycle 1 (out of 14)	14	14	14	13	8	
test cycle 2 (out of 19)	19	19	19	12	19	
test cycle 3 (out of 15)	15	15*	15	10	7	
total	48	48	48	35	34	
false positive[1] pre-ovulatory infertile phase						
test cycle 1	0	0	0	41	9	
test cycle 2	0	0	0	42	7	
test cycle 3	0	0	0	30	2	
total	0	0	0	113	18	131
false negative[2] pre-ovulatory infertile phase						
test cycle 1	0	0	0	0	3	
test cycle 2	0	0	5	0	1	
test cycle 3	0	0	0	0	11	
total	0	0	5	0	15	20
false positive[1] post-ovulatory infertile phase						
test cycle 1	0	0	1	24	71	
test cycle 2	0	0	1	62	13	
test cycle 3	0 (could be 15 because of *)	0 (could be 15 because of *)	0	51	78	
total	0	0	2	137	162	301
false negative[2] post-ovulatory infertile phase						
test cycle 1	0	0	0	1	0	
test cycle 2	0	0	0	0	0	
test cycle 3	0	0	0	0	0	
total	0	0	0	1	0	1
grade[3] [CH]	5,8	5,75	5,51	3,29	3,43	
grade [USA]	A	A-	A-	D	D	

constants		
	total number of cycles:	48
	malus myNFP =	0,25
	malus Sympto =	0,493
	malus Lily =	1,082
	malus CycleProGo =	0,824

[1]days indicated fertile but they aren't in reality
[2]days indicated infertile as they are fertile
[3]out of 6, the average required grade is 4

* in cycle 8 there are two problematic days during the rise myNFP doesn't analyse this cycle when both temperatures are present but if we put one in brackets it then works

MyNFP is the application that has the best analysis of the cycles according to NFP sensiplan (even though some changes must have been done in order for the app to analyse some cycles, see *)

Sympto has then the second best analysis strictly compared to sensiplan. It has 5 FN for the pre-ovulatory infertile phase. Those FN can easily be explained by the fact that sympto enables the Döring-Rötzer day to be modified twice for a woman however NFP only allows one change for the start day of the fertile window. The 3 FP of the post-ovulatory phase can be explained by the fact that sympto combines both NFP and Rötzer methods, which thereby closes the fertile window one day later than with the NFP method only.

CycleProGo has a lot of FP post-ovulatory as by the american rule the fertile window should last at least up to 4 days after the peak day. This explains why CycleProGo very often ends the fertile window one or two days after the other programs.The FP pre-ovulatory are explained by the fact that this program doesn't decrease/increase the amount of pre-ovulatory infertile days. The high amount of FN pre-ovulatory can be explained by the fact that NFP sensiplan starts the fertile window after 5 days for the 12 first months whereas CycleProGo starts the fertile window after 6 days for the 12 first months.

Lily is the app that has in total the most FP for both pre and post-ovulatory infertile phase. The FP pre-ovulatory can be explained by the fact that when the previous cycle couldn't be analysed by Lily the next cycle wouldn't have any pre-ovulatory infertile phase. On the other hand the FP post-ovulatory come from the fact that when Lily couldn't analyse the cycle the end of the fertile window was put on the last day of the cycle.

4 B: Detailed tables of FP/FN

Comparison with MyNFP		Sympto				Lily				CycleProGo			
		FP pre-ovu	FN pre-ovu	FP post-ovu	FN post-ovu	FP pre-ovu	FN pre-ovu	FP post-ovu	FN post-ovu	FP pre-ovu	FN pre-ovu	FP post-ovu	FN post-ovu
test cycle 1	1	0	0	0	0	0	0	1	0	0	0	2	0
	2	0	0	0	0	4	0	0	0	0	1	5	0
	3	0	0	0	0	4	0	0	0	0	1	1	0
	4	0	0	0	0	4	0	2	0	0	1	2	0
	5	0	0	0	0	4	0	0	0	0	0	0	0
	6	0	0	0	0	4	0	1	0	0	0	1	0
	7	0	0	0	0	4	0	9	0	0	0	0	0
	8	0	0	0	0	5	0	0	0	0	0	11	0
	9	0	0	0	0	4	0	0	0	0	0	0	0
	10	0	0	0	0	4	0	0	0	0	0	7	0
	11	0	0	0	0	4	0	0	0	0	0	12	0
	12	0	0	0	0	0	0	11	0	3	0	12	0
	13	0	0	0	0	0	0	0	0	3	0	10	0
	14	0	0	1	0	0	0	0	1	3	0	8	0
total		0	0	1	0	41	0	24	1	9	3	71	0
test cycle 2	1	0	0	0	0	0	0	0	0	0	0	4	0
	2	0	0	0	0	0	0	1	0	0	0	1	0
	3	0	0	0	0	0	0	6	0	0	0	0	0
	4	0	0	0	0	5	0	7	0	0	0	1	0
	5	0	0	0	0	5	0	1	0	0	0	1	0
	6	0	0	0	0	0	0	0	0	0	0	1	0
	7	0	0	0	0	0	0	1	0	0	0	0	0
	8	0	0	0	0	0	0	1	0	0	0	0	0
	9	0	0	0	0	0	0	7	0	0	0	0	0
	10	0	0	1	0	5	0	1	0	0	0	1	0
	11	0	0	0	0	0	0	1	0	0	0	0	0
	12	0	0	0	0	0	0	0	0	0	0	0	0
	13	0	0	0	0	2	0	9	0	2	0	0	0
	14	0	1	0	0	7	0	0	0	1	0	0	0
	15	0	1	0	0	2	0	8	0	1	0	0	0
	16	0	1	0	0	7	0	0	0	1	0	2	0
	17	0	1	0	0	2	0	9	0	1	0	0	0
	18	0	1	0	0	7	0	0	0	1	0	0	0
	19	0	0	0	0	0	0	10	0	0	1	2	0
total		0	5	1	0	42	0	62	0	7	1	13	0
test cycle 3	1	0	0	0	0	0	0	9	0	0	0	9	0
	2	0	0	0	0	5	0	1	0	0	1	9	0
	3	0	0	0	0	0	0	1	0	0	1	10	0
	4	0	0	0	0	0	0	1	0	0	1	1	0
	5	0	0	0	0	0	0	0	0	0	1	0	0
	6	0	0	0	0	0	0	1	0	0	1	0	0
	7	0	0	0	0	0	0	0	0	0	1	1	0
	8	0	0	0	0	0	0	10	0	0	1	1	0
	9	0	0	0	0	5	0	0	0	0	1	1	0
	10	0	0	0	0	0	0	8	0	0	1	8	0
	11	0	0	0	0	5	0	10	0	0	1	10	0
	12	0	0	0	0	5	0	1	0	0	1	1	0
	13	0	0	0	0	2	0	9	0	1	0	9	0
	14	0	0	0	0	7	0	0	0	1	0	9	0
	15	0	0	0	0	1	0	0	0	0	0	9	0
total		0	0	0	0	30	0	51	0	2	11	78	0

The ratings were calculated according to a specific formula: We penalized the cycles that had more false negative days (FN) by adding a factor 2 in front of the amount of FN. This is because a false negative day can lead to an undesired pregnancy whereas too many false positive (FP) days only lead to a longer fertile phase. FN days after the 12 initial cycles are less penalized when they are justified by 12 new cycles (sympto).

$$grade = \left(\frac{\# \; cycles \; analysed}{total \; \# \; of \; cycles} \times 6 \right) - malus$$

$$malus = abs \left(\frac{\# \; FP \; pre-ovu}{total \; \# \; of \; FP \; pre-ovu} + \frac{\# \; FP \; post-ovu}{total \; \# \; of \; FP \; post-ovu} - 2 \times \left(\frac{\# \; FN \; pre-ovu}{total \; \# \; of \; FN \; pre-ovu} + \frac{\# \; FN \; post-ovu}{total \; \# \; of \; FN \; post-ovu} \right) \right)$$

Chart, comments see above: didactic transposition and the 3 case studies

Grades of the different applications depending on the chosen criteria.
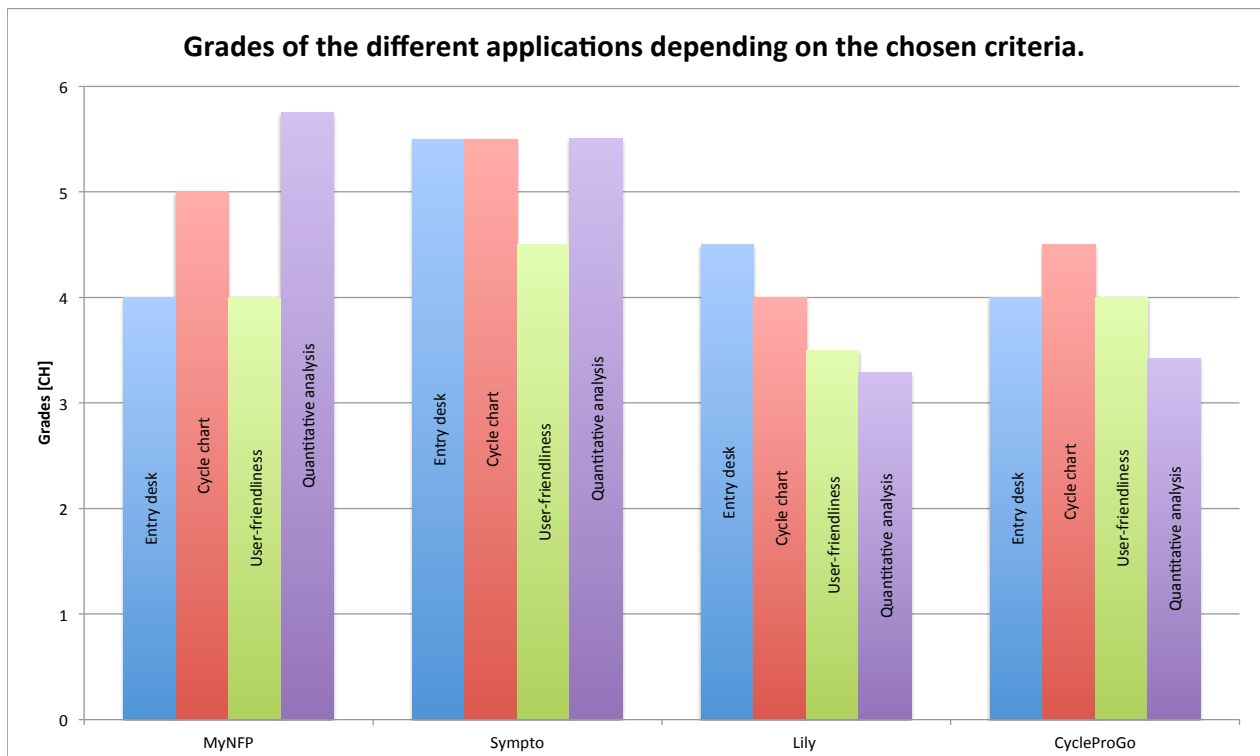
5. Policies

In this section, we compare the different policies according to some 5 vital and obvious criteria related to the mission and business plan. These criteria were rated according to a fulfill-or-not-fulfill principle of the selected key points.

5a) Transparency

1. Who is the developer of the application? What is the business named and which legal form has it?
2. Who are the leaders and members/ employees of the business?
3. Can they be contacted?
4. Do they reply?

Sympto – in the section "About us – Our history":
1. sympto is a product of the Swiss Symptotherm Foundation. One of its goals is to simplify and disseminate the symptothermal method. The history of the Foundation is also presented as well as the Foundation's Council.
2. The leaders are disclosed: the secretary, Dr. Harri Wettstein, project manager, and its president, Christine Bourgeois, as well as all other members of the Council. The sympto counselors are also available via email.
3. Contact: Sécheron 8, 1132 Lully VD, Switzerland, phone number and the e-mails of the members are indicated.
4. The members of the Foundation reply every e-mail /phone solicitation.
Points: 4/4

myNFP – in the menu „AGB" (only German menu):
1. The legal form of the business, unique associate, its register number (USt-IdNr.:DE280114771) and short history of myNFP incorporation (section „Über myNFP")
2. The individual owner of the business incorporated in Germany
3. Contact: the address (Christian Maas Korscheck
Hallstattstr. 8, 72070 Tübingen), e-mail address and internal e-mail form.
4. It replied to every e-mail/telephone received.
Points: 4/4

CycleProGo – in the menu "Terms of use":
1. American incorporation as legal form (The Couple to Couple League International, Inc.)
2. There is no individual presentation of the program authors.
3. Contact: the address. 4290 Delhi Avenue, Cincinnati, Ohio 45238, e-mail, phone and internal e-mail form.
4. Reply to e-mail. Takes a bit of time, but answers do arrive!
Points: 3/4

LilyPro – in the menu "About Us":
1. American incorporation as legal form ("Proudly Made in California 2010 - 2014, by Whimsical Inc.")
2. There is no individual presentation of its authors.

3. Contact: e-mail provided (contact@whimsicallily.com), internal e-mail form and Twitter contact option.
4. Reply to the e-mail.

Points: 3/4

II) *Security* of the whole system

1. Is there any information about the server quality and data storage?
2. Are there alternatives/options for the personal data storage and recovery?
3. Are the payment conditions and intermediaries clearly presented?

Sympto:

1. Main storage server: Webhosting, 2 Servers VPS dedicated, DRP, Back-up, OpenBusiness, info@swisscenter.ch, Lausanne;
2. There is a second server: "In case of an accident within the principal server, we decline any liability of upholding the access on sympto.org. However, your data is regularly backed up on a second server and your access is SSL secure."
Also, there are some personal recommendations for phone-users: "All data entered in the app is transferred and saved to the sympto.org account and can be retrieved. Sync your data weekly to have it backed up in your web account."
3. "The payment methods include Paypal (all credit and debit cards), Saferpay (VISA), Swiss Postcard, direct bank transfers and checks. The payment has SSL security according the safety standards of Saferpay SA."
Sympto also offers books and thermometers: Details regarding the time-frame of any product purchase: "Your order is processed within the next 3 working days after your purchase transaction. The product is shipped by ordinary mail within the next 7 working days."
Thanks to a special cycle chart, sympto can also be done manually.
Points: 3/3

myNFP:
1. There is no information about server quality for client data storage.
2. In the "Gewährleistung" ("Warranty") section we can read "We cannot guarantee that our website is continuously available and that the application and our offers can be used at any time. In general, short interruptions may occur. " No relevant details about the data storage safety.
3. In the "Beitragshöhe, Zahlungsweise" ("Total cost, payment method") menu, it is specified that myNFP allows payment by credit card on PayPal and direct debit. Also, "myNFP reserves the right to change the service provider for payment systems and add more payment methods."

Points: 1/3

CycleProGo

1. There is no information about any server for client data storage.
2. "We do not guarantee the continuous, uninterrupted and error-free operation of our system, nor that all communications will be secure from access or interference by third parties." There are no relevant details about data storage safety.
3. If a client wants to pay for a subscription, a pop-up window explains the payment conditions: "PayPal protects your financial information with industry-leading security and fraud prevention systems. When you use PayPal, your financial information is not shared with the merchant. Once your payment is complete, you will be emailed a receipt for this transaction."
Points: 1/3

LilyPro

1. There is no information about any server for client data storage. All the data is entered in the personal iPhone (stand-alone app). In case it is lost, or the app is erased, all the data is lost.
2. There are no alternatives/options presented for personal data storage and recovery.
3. No payment conditions are included when the transaction is done, but payment conditions are stated and secured by the AppStore.

Points: 1/3

III) Guarantees:

1. Do the apps guarantee method effectiveness? Do the app owners guarantee the program to interpret correctly?
2. The observations entered in the cycle charts require small modifications from time to time in order to comply with the format of the symptothermal method. Are all those changes recorded in the database together with the old, initial observations? More precisely, does the app provider offer a traceability of users' cycle data entries to show which corrections were executed?

Sympto:

1. The app guarantees method effectiveness: "Sympto.org guarantees natural contraception after a 6-month follow-up."
2. The user is informed about sympto administrators "having the right to check cycles and make any suggestions to improve cycle observations. The traceability of all modifications made by the user on her cycle chart is guaranteed. The counselor can supervise these modifications in the back office. The service quality is thus fulfilled as well as the conditions for carrying out scientific or clinical studies."

Points: 2/2

myNFP

1. The app does not guarantee method effectiveness: "myNFP does not guarantee that your intended objective is attained." It is specifically not liable for achieving or avoiding pregnancy. It only provides an automatic computation of a certain gestational probability, based on the data entered. "We accept no liability for any printing errors."
2. The user is not informed about this aspect. On myNFP, a problematic temperature can be put into brackets and it will still be visible on the chart. The same holds for correcting a PD that is put into brackets S or S+: (S) and (S+). But we did not find any information about a complete traceability system.
Points: 0/2

CycleProGo

1. The app does not guarantee method effectiveness: "you acknowledge that *no technique is 100% effective* and results cannot be guaranteed. Under no circumstances will we be liable to you, or any other person, for the achievement or avoidance of pregnancy while using the system, or for any injury, illness, or death resulting from failure to seek medical advice or reliance upon the system. "
As we have seen above in the context of didactic transposition and its transparency, the administrators affirms: „The formula for Peak Day, our NFP rules, and the manner in which other method-related algorithms have been programmed into CyclePro*Go* is part of CCL's proprietary intellectual property which cannot be disclosed." In addition, by telling that "no technique is 100% effective" CCL commits a category mistake: A good program can be 100% effective, what is not 100 % perfect are the women's observations which, in the end, are always subjective!
2. The user is not informed about this point.

Points: 0/2

LilyPro:

1. The app does not guarantee method effectiveness: "We do not guarantee birth control or pregnancy achievement with the method as described on this web site."
2. No details are presented regarding this aspect. Lily is a stand-alone phone app and all the voluntarily entered information remain on the user's phone.
Points: 0/2

IV) Confidentiality

Do the app providers share user information (personal and cycle chart) with third parties? Are these aspects discussed on the website?

Sympto: Confidentiality information is provided: the user's personal information is not revealed to third parties. Entered data can just be used for statistics and for scientific purposes, but without identity disclosure: "The sympto.ch website guarantees the perfectly confidential management of all your personal cycles." And: "While keeping your identity totally confidential, the sympto.org website may use your data for statistical and scientific purposes in order to improve knowledge of the female cycle and to disseminate the effectiveness of the STM."

Points: 1/1

myNFP: User information is not revealed to third parties. Entered data can be used for statistics, but anonymously: "Client data is stored and kept strictly confidential. Only for the contract and processing of orders is personal data submitted for internal use, and electronically stored, processed and used in accordance with data protection regulations. myNFP will not sell the data collected and stored to third parties or lease / rent or for other economic reasons to a third party." And: "We reserve the right to conduct scientific research cycle data anonymously or exchange other issues with third parties."

Points: 1/1

CycleProGo: Confidentiality information provided: the user's personal information is revealed to third parties that agree to keep this information confidential. Entered data can be used for statistics, but without identity disclosure ("de-identified").
"We will share your personal information with trusted third parties who assist us in operating our website, conducting our business, or providing service to you, so long as these parties agree to keep the information confidential. We will also share your submitted Information with third-party Users you specify.
Otherwise, we do not rent, sell, or transfer email addresses or other personal information to any third parties.
We may share certain de-identified submitted information, such as chart data, with third parties for research and educational purposes."

Points: 1/1

LilyPro: No data collection: "No behind-the-scenes data collection of any kind". Lily is a stand-alone phone app and all voluntarily entered information remain on the user's phone.

Points: 1/1

V) Subscription conditions

1. There is consensus about this point: Symptothermal teaching should be available to everyone. Why put an age limit on app usership, especially when teens starting at age 16 may choose a birth control method without parental consent? By imposing an age constraint, the application just reveals a higher level of usage rigidity. Therefore, no point is given if this app condition prevails.

2. Which are the conditions for deleting the account? Is it a secure process? Is this aspect also discussed in the app details?
3. What about cycle data? Is there accurate information provided about their storage time span and deletion conditions?

Sympto:

1.There are no conditions imposed that limit access to the app or teaching manual: "Teenagers may use sympto without any parental consent."
If the user wants to purchase the low-cost service "Star4Teens", which is dedicated to teenagers under 19 years of age, sympto may ask for ID: "Persons under the age of 19 must submit personal ID to sympto.org to proof that they are eligible for the Star4Teens program."
2. The conditions for deleting an account are included: "A client cannot delete her account because of possible abuse but she can ask sympto.org to deactivate it." sympto is the only provider of this category that does not allow users to delete their accounts themselves. No score received. However, on sympto, the user can erase all her data entries and there are specific reasons why the user cannot delete her account.

3. There is information provided about the duration of cycle data storage and deletion conditions: "Sympto.ch keeps stock of at least your most recent 12 cycles or the last 360 days (when your contract expires). Even if you do not synchronize for several months you can start all over again or continue as long as your account is active."

Points: 2/3

myNFP

1. Age conditions imposed for subscription: "Persons under the age of 18 can only enroll into the myNFP program with the explicit consent of parents or guardians." =>no point received
2. The conditions for deleting the account are included: "An account that is not used for 24 months is automatically deleted or when we become aware of an unauthorized third party." A user can delete their account on their own, just selecting the option "Close the account", from the "Settings" menu, without any app staff involvement.
3. There is information provided about storage duration – cycle data is stored until an account is closed (24 months if the account is not used).

Points: 2/3

CycleProGo

1. Age conditions imposed for subscription: "You can use this system only if you are at least 18 years old, if you live in the United States, and if you are of the age of majority in your place of residence." => no point received.
2. Conditions for deleting an account are not included. There is mention of that they "do not knowingly collect personal information from individuals under the age of 13. If we become aware that we have inadvertently collected personal information from an individual under the age of 13, we will delete that personal information."

3. There is information provided about the time span of cycle storage: "We will retain your submitted information and personal information for as long as your account remains active. However, we reserve the right to delete submitted information that is over five years old."

Points: 1/3

LilyPro

Points: this developer is not directly concerned with these criteria, as there are no online storage possibilities.

1. The app can be downloaded from the AppStore. There is an age restriction: "This iTunes Service is only available for individuals aged 13 years or older, unless you are under 13 years old and your Apple ID was provided to you as a result of a request by an approved educational institution. If you are 13 or older but under the age of 18, you should review this agreement with your parent or guardian to make sure that you and your parent or guardian understand it."

2. There are no conditions for deletion of an account: you just have to delete the app from your Apple device.

3. The stand-alone app can be used for an unlimited period of time: "Once you bought Lily, it's yours to use without any restrictions and hidden costs for as long as it pleases you."

Final score (out of total of 13 points)**:**

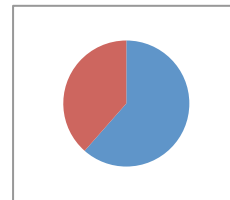Sympto: 4+3+2+1+2=**12** ;

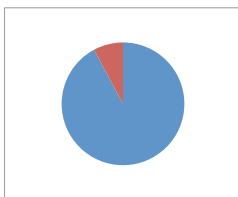myNFP: 4+1+0+1+2=**8**;

CycleProGo: 3+1+0+1+1=**7;**

LilyPro: 3+1+0+1=**8 out of 10** points

Those final points, translated into the Swiss marking system (which allows a maximum of 6 points), is as follows:
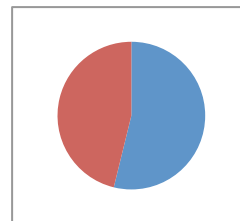
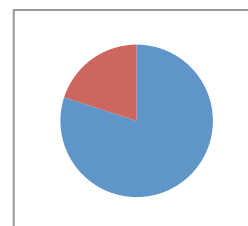$$\textbf{myNFP} - \frac{8}{13} * 6 = 0.61 * 6 = 3.69$$

$$\textbf{Sympto} - \frac{12}{13} * 6 = 0.92 * 6 = 5.53$$

$$\textbf{CycleProGo} - \frac{7}{13} * 6 = 0.53 * 6 = 3.23$$

$$\textbf{LilyPro} - \frac{8}{10} * 6 = 4.8$$

Graph interpretation: A full blue circle corresponds to a maximum of Swiss grade 6.

6 Pricing – analyzed but not rated. Why?

This content of this section is rather unusual, as this market does not really exist yet! The prices that the different systems propose are more symbolic and destined to encourage women. They do not express at all the added value of this kind of service. As a matter of fact, most women do not realize the true value of their cycle observation. In the media, in health departments and at medical faculties, this knowledge is not at all up-to-date: Most physicians have an inaccurate knowledge of symptothermal cycle observation and therefore discourage women to observe their cycles. This inaccuracy is worse than no knowledge at all as it misrepresents the effectiveness of symptothermal fertility management. As a result, many women still believe that this knowledge is a myth. When they discover the integrity of the symptothermal method they often reject it for realizing that they were wrong. This is a great hindrance in the dissemination of the method.

A full and personal symptothermal consultation of 1 hour costs about 100 CHF in Switzerland. This fee corresponds to paramedical prices. In France, one consultation costs between 30 and 60 Euros. We will not discuss these prices here; they are proportionate to a counselor's credentials and the country. Up to now, no symptothermal organization is able to pay salaries generated by revenues from symptothermal activities.

We developed 3 key points that deal with the pricing:
1. Manual and teaching material (electronic and/or printed)
2. Implemented app: web access and/or phone app
3. Client support: individual and personal online counseling.

Does each business provide these 3 services to the user in their learning process? If yes, are these services free, free but limited, or what are the fees? It seems logical that in order for the 4 app developers (Sympto, myNFP, CycleProGo, LilyPro) to accomplish a complete NFP learning curriculum, these 3 aspects are an advantage for a clear and effective understanding. Some specific reasons are:

1. If there exists an electronic interpretation, which is the case with all providers, then it should be properly explained by a manual or learning material. It represents an indispensable map of the app guiding a user during the learning curve. Without such a material, there are many pitfalls for the user leading to misunderstanding and misinterpretation. The quality of the learning process will, when correctly implemented, increase the method efficacy.
   Therefore, in order to increase the transparency and learning process in the app or its associated material, appropriate teaching material should be available to the user. This will make sure that the app be more attractive and easy to understand. Complete, concrete and organized information does represent a true advantage.

2. In this study, the app interpretation represents the core of each business. In order to encourage women to test it, a free trial period is generally proposed. During the free days, women might receive motivation messages in order to help her discover the method.

On sympto, repeatedly, women tell us that they are "not interested" in the app when receiving the motivational texts. This kind of reaction shows that women do not – may be cannot – appreciate this novelty, yet, even though it is obvious that every woman should be profoundly interested in such an empowering knowledge, or at least express some curiosity. The result we are faced with now is that the free trial offer does not suffice to communicate the basic message. We can reasonably guess that other developers are faced with the same problem.

On sympto we also realize that only about 5 % of all newcomers from the app stores end up try practicing the method, the remaining 95 % are like deaf to this cause. On the other hand, we also realize that many women use the sympto free app for years and are not aware that they could actively spread the knowledge among their friends. myNFP asks for 2 E per monthly use. This strategy suggests that women are not ready to pay a real price, yet, but may yield an income when their numbers increase in the future. On sympto we try to generate income from ads but these earnings are ridiculously low as long as the number of users is not growing substantially. The in-app purchase price for the unlimited sympto PLUS is relatively high, 16 E, but in reality it should be much higher.

3. Besides the teaching material and the electronic interpretation, the main link between the app provider and the user is built through the individual support: the counseling services that every client can have access to. A personal counselor does not only help for a better understanding of the method and of the body, but also represents a long-term investment for the woman's personal development and health. This is the main service where income can be generated. sympto, which guarantees natural contraception after a 6 months follow-up, tries to convince women to purchase at least these 6 months of counseling for 150 CHF (160 $). But the resistance is still there among most women who do not realize that sympto is the only contraceptive program that guarantees this degree of effectiveness.

In Catholic communities, symptothermal courses are offered or relatively cheap, and counselors are volunteering most of the time. In the non-faith oriented schools, a similar service is mainly available via personal counseling for about 50 - 100 $ per hour. For the future symptothermal teachers, expensive courses on Skype, Hangout, etc. are suggested by some organizations. These do not believe at all in interpreting apps because they would diminish their (little) business drastically. Their clients, a tiny minority, who firmly believe in this kind of "handicraft" teaching, is ready to spend between 4000 and 5000 $ to learn the manual method in order to become a symptothermal teacher! On sympto, the teacher course costs about 1200 $! At this point, especially American beginners, don't see the advantage of sympto's direct and relatively cheap online counseling, made possible by a genuine message box system: six months follow up for 150 CHF (160 $) backed up by a *Complete Symptothermal Guide*, free of charge!

Many women are lost on symptothermal sites and are not willing to put in an effort even if it is free, let alone to pay a counselor. As there is no open discussion of this kind of business, we are surprised to learn that, except on sympto, symptothermal communities tend to become sectarian like myNFP in its NFP-forum (Germany) or TCOYF of Toni Weschler (USA). The Catholic communities have already had this attitude over the last 20 years band are not able to cooperate positively. It is interesting to see that sectarian behavior is not necessarily linked to religious groups!

We present these 3 points of the 4 compared apps in some extensive tables to make it more systematic and with different colors. As a summary:

1. Teaching material: **green color**. Only sympto and LilyPro offer online manuals but sympto's is much more comprehensive. myNFP and CycleProGo websites contain just learning tutorials and refer to external teaching material.
Printed manual is available for all the organizations, except for LilyPro. Another important point here is that only sympto's manual is available in more languages: French, German, Italian, Spanish, Polish and English.

2. Implemented app (web access/phone app): **red color**.
sympto: premium web access and iOS, Android, Windows: all options include a free trial period with free counseling, but require a payment afterwards in order to be fully accessible. However, the sympto free version is always offered free of charge.
myNFP: Premium web access, iOS, Android (only entry desk). For iOS installation, an initial purchase is required. After 1 month, the user has to pay for premium access. This access keeps the app open! There is no unlimited free app.
CycleProGo: Premium web access, iOS, Android, Kindle: all of them offer free trial access. This, however, is not synonymous with free access to all options. For premium access, a monthly payment is required, as on myNFP.
Lily: The iOS stand-alone app asks for an initial payment in order to establish an unlimited access.

3. Client support (individual and personal counseling): **yellow color**. Only sympto offers direct online counseling through its message box system, all the others depend on face-to-face consultations by Skype, Hangouts, emails or meetings.

Applications comparaison pricing – November 2014

A well-designed and easy-to-learn method has to offer the following instruments	•TEACHING MATERIAL (MANUAL and TUTORIALS)		•App	•PERSONAL COUNSELING (SERVICES)
TEACHING MATERIAL	sympto	myNFP	CycleProGo	LilyPro
Electronic manual and tutorials	Complete Manual - free	Tutorials - free	Tutorials - free	Brief manual - free
Printed manual	Complete Manual € 25.16 (Amazon)	Natürlich & sicher: Das Praxisbuch € 14.99 (Amazon)	Art of Natural Family Planning € 26.56 (ccli.org)	-
Printable empty charts	YES - Free	NO	NO	NO
APPS				
With premium web access	sympto	myNFP	CycleProGo	LilyPro
Access after free trial without any payment	YES, 1 additional premium month with Love Game, but without any personal counseling	NO: no new entries, but possibility to see the previous recorded cycles during 24 months	YES, access to account, but impossibility to take any action	No premium web access
Personal counseling	YES	NO	YES, after having found a teaching couple	
FREE TRIAL	15 days	1 month	3 months, but no full premium access	
iPhone/iPad: use	sympto	myNFP	CycleProGo	LilyPro
		without premium access after free trial		
FREE	YES		YES, but no full premium access	
Period	unlimited		3 months, linked to premium access	
Stand-alone /web app	Web app		Web app with some stand-alone	
Premium web access	no		yes, 3 months	
In-app ads	YES		NO	
Web and phone access to previously recorded	only phone access	NO illimed acces as the iPhone access is linked to the premium access	YES, both	
Access after free trial without any payment	YES, 1 additional premium month with Love Game, but without any personal counseling		YES, access to account, but impossibility to enter any new observation	No free trial on iOS. Only avilable after payment

iPhone/iPad - counseling and/or premium access	sympto	myNFP	CycleProGo - automatic payment renewal			LilyPro
Cost	Directly correlated and depending on the Sympto counseling service purchased: see details below	€5.49, one payment without any counseling linked to premium access	5 USD	12 USD	35 USD	€5.49
Period		1 month	1 month	3months	12 months	Unlimited
In-app ads	NO	NO	no			NO
Calendar and Daily views and charting: see criteria 1 and 2	YES	YES	YES			YES
Web-access to previously recorded charts	YES, with premium access, see below	Yes : Premium access 2 Euros per month (24 / year)	YES			NO
Exporting charts	YES, with free decison to limit confidentiality	YES, with free decison to limit confidentiality	YES, with free decison to limit confidentiality			YES but without confidentiality permission
Didactical reminders	YES	NO	NO			no
Statistics on previuos	Limited: shortest and longest cycle	all sorts of stats	all sorts of stats			all sorts of stats
Windows	YES (same characteristics as the iPhone app)	NO	NO			NO
Kindle	NO	NO	YES (same characteristics as the iPhone/Android)			NO
Android - FEES for use	sympto	myNFP	CycleProGo			LilyPro
Name	Sympto Plus and Top secret	MyNFP	CycleProGoTM			No Android Application, just iOS
Special characteristic	sympto PLUS: Data entries syncronized with web-app. Top secret: Data remain on the phone	-	-			
Period (months)	Unlimited	1 month	1 month	3months	12 months	
Cost	sympto PLUS: 16 Euros and Top secret: 10 Euros	€1.99	5 USD	12 USD	35 USD	
Stand-alone /web app	YES	web-app	Some stand alone features			
Premium web access	NO	YES	YES			
In-app ads	NO	NO	YES			
Web-access to previously recorded	NO	YES	YES			

PERSONAL COUNSELING: details	sympto - no automatic payment renewal						myNFP	CycleProGo	LilyPro
Name	Sympto-Daisy	Sympto-Daisy+	Star4Teen	Sympto Edelweiss	Sympto Marguerit	Symptothermal consultations	myNFP	CycleProGo	LilyPro
Characteristic	more thant 19 years	more thant 19 years	age under 19	one month of counseling					
Period (months)	1	6	6	Unlimited use of premium access	Unlimited use of premium access				
Cost	€ 24.60 (30 CHF)	€ 123 (150CHF)	€ 49.2 (60CHF)	€ 244.36 (298CHF)	€ 200.9 (245CHF)				
Special cost OFFER	5 months paid: +1 month free; 9 Daisies = Marguerite: non limited access	125 CHF (if Edelweiss or Marguerite purchased)		Thermometer included	Discount for sympto counseling . New Daisy 25 CHF instead of 30 CHF	Discount for external counselor or any symptthermal counselor. According to the tariffs applicable for each sympto counselor or any NFP Sensiplan	External counseling with NFP Sensiplan	Internal teaching and counseling from CCL	No personal counseling, no reference of counseling services
Certificate for the user	NO	YES	YES (Star4Teen)	NO	NO				
SPONSORSHIP	sympto						myNFP	CycleProGo	LilyPro
Open source and donations	Offering opensource and asking for donations, especially for electronic manual						NO	NO	NO