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Theoretical Explanations of Increasing Childlessness – Divergent Approaches and the Integrating Potential of the Frame Selection Theory

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Abstract*:* In order to explain the increasing childlessness in numerous European countries since the 1960s, research points to sociocultural changes on the one hand and rising costs of family formation on the other hand. Yet, there is no comprehensive theory capable of integrating both causes and their interaction. This paper discusses the possibilities of an integrative model which is based on frame selection theory. The model refers to decisions in relationships and discusses the interaction between sociocultural orientations and structural incentives. The resulting hypothesis that the effects of incentives on family formation depend on the situational compatibility of a family-framed relationship perception is subsequently empirically tested using the German family survey panel (Familiensurvey).

Keywords: Fertility · Declining birth rates · Demographic change · Relationship · Family survey

1 Introduction

Due to the far-reaching consequences of demographic changes, the increase in childlessness since 1965 is one of the currently most-discussed aspects of social development in Germany.[1] Scientific literature points to a number of causes (for a recent overview see *Peuckert* 2008: 114-122) that seem relevant to explain both the increasing postponement of family formation and the increasing childlessness. However, a mere list of causes does not lead to a consistent explanation (*Peuckert*

[1] Life course research points out that the increasing postponement of childbirth to a higher age plays an important role. However, even when referring to birth rates of different birth cohorts, an increasing childlessness – especially in West Germany – is evident (*Dorbritz/Ruckdeschel* 2007; *Pötzsch* 2012).

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2008: 114); a theoretical approach that is able to integrate the relevant factors into a consistent model is needed. This is problematic insofar, as, on the one hand, sociocultural as well as economic-structural changes are considered relevant (cf. *Kaufmann* 2005: 122-158; *Burkart* 2008: 41-49; *Peuckert* 2008: 114-122; *Kreyenfeld/Konietzka* 2008) and, on the other hand, established theories refer to *either* sociocultural changes *or* economic-structural changes. To achieve a consistent explanation, it is necessary to either rule out one of the dimensions as irrelevant or formulate a theoretical model that is able to integrate both dimensions and relate them to each other. Such a model needs to account for the interaction between cultural-institutional factors and economic-structural factors. It has to connect institution-led (or norms-led) and utility-maximising behaviour. Frame selection theory (FST) claims to be an integrative behavioural theory encompassing different types of behaviour and explaining which conditions influence the selection of one of these types (*Esser* 1996, 2001; *Kroneberg* 2005). This article examines whether FST can live up to its claim in terms of explaining increasing childlessness.

Section 2 focusses on the core arguments of the divergent sociological approaches in order to show their disparities. In section 3, the divergent arguments are integrated into a single theoretical model based on frame selection theory. The contribution of this paper is considered to be mainly theoretical; nevertheless, the resulting hypotheses are empirically tested in section 4. First empirical results are presented, however, due to various data limitations these need to be considered provisional and preliminary until further research can validate them. The data are limited, as the method of data collection was not developed to operationalise the mechanisms this paper is interested in. Hence, the validity of the data is restricted. Second, the dynamics of the assumed processes cannot be tested.

2 Divergent Explanations: Demonopolisation Theory and Opportunity Cost Theory

Whereas explanations based on rational choice theory (hereafter RCT) emphasize the effect of changing structural-economic conditions on family-related behaviour (for an overview cf. *Hill/Kopp* 2006: 102-146, 194-206), different macro-sociological theoretical traditions view family as a transforming social institution and thus focus on the effects of sociocultural-institutional processes (for an overview cf. *Huinink/Konietzka* 2007: 101-125). These theoretical divergences also concern the increasing renunciation (or postponement) of family formation, as the demonopolisation theory and the opportunity cost theory illustrate.

2.1 Demonopolisation Theory

The assumption that there is a demonopolisation of the sociocultural pattern for leading a familial and private life – simply labelled demonopolisation theory – can be identified as the common idea of different institution-centred explanations of family-demographic change. The concept of an institutional transformation of the family

is quite common; however, a substantial, falsifiable theory can only be developed by precisely describing these institutions and their changes. Still noteworthy therefore is the idea of a deinstitutionalisation of the family by *Tyrell* (1988) that refers to the civic family model described in historical family research (*Rosenbaum* 1982: 251-380) and its development during the second half of the 20th century. Elements of this sociocultural model – which developed under specific social conditions – are the emotional basis of family relationships, the separation of employment and family life, the family as a safe haven, a gender-specific division of labour and an emphasis of the responsibility of parents for their children.[2] The theory assumes that this civic family model, which is continuously institutionalised throughout modern times until the second half of the 20th century, loses its monopoly as the one predominant sociocultural model of private life from the 1960s onwards (*Tyrell* 1988: 150-151).[3] Marriage, for example, was indispensable for approximately 90 percent of West German people in the 1960s (*Köcher* 1985). In 1988, only 66 percent agree to the statement that a couple should marry if they are in love, and, in the year 2000, only 55 percent believe that marriage is necessary, if they have children (own calculations based on the family survey). At the same time, there is a rising share of people who can imagine living without children (*Institut für Demoskopie Allensbach* 1993). The traditional family model losing its monopoly position also involves the loss of legitimations and sanctions manifested e.g. in the amendments of family laws and the increasing acceptance of divorces and alternative ways of living. For example, the share of people agreeing to the statement that "a divorce should be made as easy as possible" more than doubled in West Germany between 1950 and 1980 (*Köcher* 1985, translated by CPoS). In the course of this development, "basic matters of course are removed" (*Tyrell* 1988: 154, translated by CPoS). The formerly cognitively linked elements – love relationship, marriage, sexuality, parenthood – do not belong together unquestioningly anymore. Consequently, the range of sociocultural established concepts of private life increases.

In this sense, the idea of deinstitutionalisation is also represented in the sociological concept of individualisation. Individualisation – understood as a growing independence of individual behaviour from sociocultural norms and orientations (*Beck/Beck-Gernsheim* 1994: 11-12) – implies a decreasing effect of the traditional model of private life and an increase of alternative options. Such an increase is also implied by the demographic concept of the second demographic transition, which interprets increasing childlessness as a sign of "increasing manifestations of individual autonomy" (*Lesthaeghe* 1992: 313, translated by CPoS). The idea that this development leads to an unlimited number of options needs to be clarified, though. Deinstitutionalisation does not imply the traditional family model to be eliminated from the range of cultural orientations; it merely assumes a weakened "in the sense of reduced (but not eliminated) institutional quality" (*Tyrell* 1988: 145,

2 For a detailed description of this model see the respective work by *Rosenbaum* (1982).

3 Note that the family model is seen not only as a model for family life, but also as a model for private life in general.

translated by CPoS). Thus, the traditional family model is demonopolised, but it is not forgotten (*Hoffmann-Nowotny* 1996: 120). This is also posited by (more recent) system theoretical family sociology, which considers new patterns of private life to be functional differentiations of private institutions (*Meyer* 1993). Thus, the traditional family model, which has gone through a semantic change towards a primarily "child-focused" institution (*Nave-Herz* 1989: 217-218; *Meyer* 1993: 27-28) competes with new institutionalised models of private life differentiating themselves from the family- or child-focused model by being "couple-focused" or being designed for individual needs (*Meyer* 1993: 28-32). In conclusion, deinstitutionalisation theory, individualisation theory, and system theoretical family sociology conjointly attribute the changes in family formation to the demonopolisation of the traditional family model.

2.2 Opportunity Cost Theory

A common feature of different RCT-explanations of increasing childlessness is the impact of changed incentives on behaviour, first of all the increasing opportunity costs of parenthood (here simply labelled opportunity cost theory). Whereas the utility function of fertility behaviour provides plausible explanations especially for the long-term decline in birth rates (*Leibenstein* 1957), the cost function is relevant for the more recent decline in birth rates in the second half of the 20th century, which is primarily caused by an increase in childlessness.[4] The importance of the costs of a family were pointed out by new home economics (*Becker* 1960). Based on this theoretical tradition and given the educational expansion during the 1960s, the impact of greater educational and employment opportunities for women were emphasised in diverse studies (e.g. *Klein* 1989). In the context of "a structural ruthlessness towards the family" (*Kaufmann* 1990, translated by CPoS), educational and earnings-related opportunity costs of family formation increase with the access to higher education and the income potential of women. Opportunity cost theory can base its findings on numerous empirical studies finding an impact of education level on family formation. Many studies show a reduced birth rate of women in education (e.g. *Blossfeld/Huinink* 1989; *Kurz* 2005; *Schröder/Brüderl* 2008). Further, a "level effect" (*Brüderl/Klein* 1991, translated by CPoS) of female education can be observed in West Germany. Women with a higher level of education remain childless more often (e.g. *Klein* 2003; *Kreyenfeld/Konietzka* 2008). Opportunity cost theory states that this education effect only influences the rate of first-born children but not of

[4] Whereas the percentage of childless women born in West Germany in 1933-38 was only 11 percent, this value increased to 19 percent in 2008 for 45-49 year-old women who had largely completed their fertility biography (birth cohort 1959-64) (*Pötzsch* 2012). Despite decreasing rates of family formation in both parts of Germany, considerably lower rates of childlessness (even for younger age groups) can be found in the states of former East Germany (*Pötzsch* 2012). Analyses of fertility that include the number of children for men point to an even higher childlessness of men for all age groups (*Klein* 2003). The decline of birth rates in West Germany since the 1960s is mainly caused by an increase in childlessness and furthermore by a decrease in the number of third and fourth children (*Birg et al.* 1990: 28)

further births, which is also confirmed by empirical findings (*Kohlmann/Kopp* 1997). Nevertheless, all these results cannot rule out that sociocultural change does also influence decreasing rates of family formation.[5]

However, a stringent RCT-model cannot include sociocultural change processes without substantial modifications or amendments of basic theoretical assumptions (*Elster* 1989; *Münch* 1998). Accordingly, the decision to (temporarily) renounce family formation is understood as "a rational response to the different sociocultural opportunities and life chances" (*Kopp* 2002: 98, translated by CPoS), and the development of birth rates is "not a result of values, simple cultural conditions or purely traditional behaviours" (*Kopp* 2002: 98-99, translated by CPoS).

3 The Integrating Potential of Frame Selection Theory

On the one hand, deinstitutionalisation theory, individualisation theory, and differentiation theory state that behaviours changed due to the demonopolisation of the traditional family while not being able to explain the empirically proven impact of education on behaviour. On the other hand, RCT views behavioural changes as an adaptation to changed incentive structures, consciously avoiding the influence of cultural-institutional processes. In order to achieve a consistent explanation, the relevance of cultural-institutional conditions needs to be negated. Alternatively, a theoretical model needs to be found that describes the effects of both institutional role models and changed incentives and accounts for their interaction. While RCT-centred approaches strive to achieve the former solution, FST is appropriate for the latter, given that it aims to integrate theories of norms-led or institution-led behaviour and utility-maximising behaviour.

3.1 Frame Selection Theory

FST is based on the assumption that any behaviour is preceded by a situational interpretation, which is based on cultural, institutionalised models and thus frames behaviour (*Esser* 2001: 259). Whether and how utility and/or cost criteria influence behaviour depends on the constellation of different determinants. The (subsequently relevant) version of FST by *Kroneberg* (2005) proposes three "model selections": the selection of a *frame*, a *script* (a program for behaviour), and a specific *behaviour option*. Usually, the selection of a particular frame leads to the selection of a specific script, which again leads to the selection of a particular behaviour option (*Kroneberg* 2005: 351-353). Crucial for selecting a model is the *match*, i.e. the strength of a spontaneous activation of a cognitive model (frame, script, behaviour). The match (m_i) of a frame (F_i) is determined by the mental anchoring (a_i) of the frame,

[5] Controlling for education effects, generational effects on the rate of family formation do not disappear (cf. *Klein* 2003: 518). Generational differences reflecting the increase of childlessness can therefore be partly, but not completely, explained by different levels of education.

the clarity of relevant situational features (o_i), and the strength of the symbolic link between situational features and the cognitive model in the individual's mind (v_i). The selection weighting (G) of the frame is defined as $G(F_i) = m_i = a_i * o_i * v_i$ (*Kroneberg* 2005: 351).[6] Generally, model selections can be rationally reconsidered and revised if necessary. The according "mode-selections" decide whether the model is followed automatically-spontaneous (as-mode) or whether it is rationally reconsidered (rc-mode). The match of the according frame also shapes mode-selection. The weaker the match, the more likely a spontaneously expected deliberation gain initiates a transition to rc-mode. On the other hand, this transition will not occur if the match is very strong, even in the case of large expected gains. The condition for the transition to rc-mode is defined by $p(1\text{-}m_i)(U_{rc}+C_f) > C$ (*Kroneberg* 2005: 355): In rc-mode, a certain gain is calculated by weighting the expectation $p(1\text{-}m_i)$, which is strongly influenced by the match m_i This gain is determined by the expected utility of an alternative interpretation (U_{rc}) and the avoidance of misinterpretations (C_f).[7] If this gain is greater than the deliberation costs, the transition to rc-mode, i.e. to utility-maximising behaviour, occurs. In this case, the situation is assessed rationally. Whether the according frame is kept or not is determined by utility criteria.

3.2 Applying FST to the decision on parenthood

Following *Esser's* (2002) theoretical concept of the "framing of marriage", an FST-based approach on family formation can refer to the framing of couple relationships. Relevant is thus the situational context of (yet childless) couple relationships and the existing sociocultural options of interpretation. First, the framing of the relationship needs to be clarified. Terms such as "liaison", "affair", "temporary companion", "open relationship" etc. demonstrate that relationships can have different interpretations. Thus, there are many possibilities to frame relationships. Depending on the character of the relationship, it can be interpreted, for example, as a stable and reliable or rather a non-committal, loose partnership. Put together, these characteristics determine whether both partners interpret their relationship as a "family to be", i.e. a relationship that is developing towards family formation. In this case, the relationship is framed with a reference to family. The various options of framing a relationship imply different expectations and demands (of oneself). In the case of a family framing, this applies to, among others, lasting solidarity and reliability, high interaction, and the goal of family formation. In the case of alternative relationship framings, other expectations are emphasised instead – e.g. regarding sexuality or shared experiences.[8]

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6 For the selection of the script and the behaviour option see *Kroneberg* 2005: 351-353.

7 The utility U_{rc} needs to be interpreted as a vague "existence hypothesis" (*Esser* 1996: 22), which can only be based on internalised experiences. pU_{rc} can therefore be interpreted as a spontaneously expected deliberation gain.

8 This does not imply that a family framing rules out such expectations. Expectations regarding shared experiences or sexuality are not emphasised as much, though, as in the case of an alternative relationship framing.

FST can theoretically determine what conditions lead to the selection of a family framing; the equations in Table 1 relate to these conditions. The subscript "fam" indicates a family framing. For simplification purposes only *one* alternative framing is considered. The subscript "alt" refers to the most promising framing out of all the alternatives. Whether the family frame is selected depends on the simultaneous selection of model and mode. For the model selection (1), the match of the family frame needs to be stronger than the match of a competing frame. Within mode selection (2), it is determined whether the behaviour of the script is adopted without reflection or whether a transition to the deliberate mode occurs. The upper part of Table 1 illustrates the conditions that do *not* lead to a transition to the deliberate mode. This transition happens when deliberation costs (C) are not too high and individuals assume that deliberation will lead to an increased utility (U_{rc}) or an avoidance of misinterpretations (C_f). However, a strong match of the family frame (m_{fam}) modifies this expectation. If the relevant situational and relationship features are clear, a family framing in as-mode also occurs when family formation includes high opportunity costs. This is a case of *spontaneous family framing*. The implied demands (of oneself), expectations and the according behaviour are independent from utility and costs.

In case of a weaker match, the transition to rational deliberation occurs (3). However, the family frame and its script are not yet renounced. Mode selection is initially only led by the vague assumption that there may be a "better" model for the situation. If rational deliberation occurs, an alternative is not automatically adopted, but subjected to another, now deliberate-rational selection process. Now the instrumental utility U of each interpretation and its subjective expected probability p become relevant (*Kroneberg* 2007: 218). Since the fit between the interpretation and

Tab. 1: Selection criteria of a family framing

(1) Model selection	(2) Mode selection	
$m_{fam} > m_{alt}$	$p(1-m_{fam})(U_{rc}+C_f) < C$	→ Spontaneous selection of the family frame
if $p(1-m_{fam})(U_{rc}+C_f) > C$ →	(3) Rational deliberation	
	$p_{fam}U_{fam} > p_{alt'}U_{alt}$	→ Utility-maximising selection the family Frame

m_{fam}: Match of the family frame
m_{alt} : Match of an alternative frame
U_{rc}: Expected utility of a rational deliberation (deliberation gain)
$p(1-m_{fam})$: Expected probability of a deliberation gain
C_f: Costs of a misinterpretation
C: Deliberation costs
U_{fam}: Instrumental utility of the family frame
U_{alt}: Instrumental utility of an alternative frame

Source: Own design

the situational features indicates the probability of reaching the utility of an interpretation, p corresponds to the match m. If the alternative interpretation is consistent with the situational features (so that m_{alt} or p_{alt} take on a high value) and the alternative interpretation leads to a comparatively high expected utility ($U_{alt)}$), this supports a renunciation of the family frame and the corresponding behaviour. However, if deliberation leads to the expectation that the family frame is more gainful (as p_{fam}, m_{fam}, or U_{fam} take on a high value), this leads to a *utility-maximising family framing* of the relationship.

These considerations lead to the hypothesis of an *interaction effect* of partnership situation and incentive structures on relationship behaviour. A transition to rational deliberation only occurs in the case of a weak match. Only under these conditions do incentive structures influence behaviour.

> *Hypothesis 1 (Interaction Hypothesis)*: The better a family framing of the relationship matches the situation, the less relationship behaviour – including the decision of parenthood – is guided by utility/cost criteria.

Note that simultaneously with selecting a certain frame a certain behavioural programme is activated. The script of the family frame, which is still shaped by the historical model of the civil-modern family, prescribes not only "if" but also "how" a family is formed. After all, the traditional model does not postulate family formation "at any cost", but a "responsible parenthood" (*Kaufmann* 2005: 314, translated by CPoS). Cultural-historically this can be justified by the Western European principle of neo-local family formation described by *Hajnal* (1965). System-theoretical family research further postulates that the significance of parental responsibility in the family frame has increased in recent decades (*Meyer* 1993; *Nave-Herz* 1989). How the script of responsible parenthood is implemented is decided on the level of behavioural selection, which is subject to rational criteria. Thus, the timing of family formation within the family frame follows rational considerations. It can be expected that the pattern of couples postponing first births until their education has been completed (cf. e.g. *Blossfeld/Huinink* 1989; *Kurz* 2005) can also be observed for relationships with a family framing:

> *Hypothesis 2 (Script Hypothesis)*: A family-framed relationship implies a script for responsible parenthood. Thus, family formation is an imperative, yet the timing is deliberately chosen.

3.3 The increase of childlessness represented by the FST model

These considerations can be related to historical changes and the respective explanations of demonopolisation and opportunity cost theory. It is crucial that the fit between frame and situation depends on the extent to which interpretations are socioculturally present. On the micro-level of the explanation this concerns mental anchoring of frames (a) and the symbolic link between situational features and the cognitive model in the individual's mind (v). In this regard, demonopolisation of the traditional model means that partnership situations, which were previously exclusively linked with the family frame (due to its monopoly), have become compatible with other framing options in the course of social change. In times when the fam-

ily frame had a monopoly, "romantic love 'urges' for marriage, marriage 'naturally' implies cohabitation and sexuality, and thus suggests 'having children' and consequently family formation" (*Tyrell* 1988: 154, translated by CPoS). Whereas previously a relationship could only be (and therefore was) associated with the family frame, demonopolisation has made individuals aware of other frames that can be associated with relationships. The following explanation of the historical change of birth rates takes these considerations and assumptions into account. It is based on framing theory and integrates the divergent explanations for this development mentioned above into a comprehensive and interrelated model. This model implies that due to a continuous sociocultural demonopolisation of the traditional family model, alternative interpretations of relationships emerge. According to FST, a family framing needs to fulfil certain conditions: a clear fit of the partnership situation becomes the core criterion for a (spontaneous) family framing of the relationship. If this condition is not fulfilled, a family framing can still occur employing utility maximisation, however low (opportunity) costs of parenthood are then a necessary precondition – one that is fulfilled less and less frequently in the course of social change.

The postulated increasing importance of the partnership situation follows from the match (m) being dependent on the clarity of relevant situational features (o) in order to select a particular frame from various framing options. The broader the spectrum of eligible frames the clearer situational features must point to a certain frame for a spontaneous framing to succeed. Otherwise, a transition to rc-mode is likely. In this case, utility criteria and opportunity cost theory become relevant (Interaction Hypothesis). The FST based approach interprets changed incentives and opportunity costs as changes in utility attribution (U-parameters) to the frames. Lower incentives of parenthood lead to lower U-values of the family frame, increased opportunity costs are reflected in higher U-values of competing frames.

Thus, the process of demonopolisation attenuates the match of a family framing (m_{fam}). Moreover, greater educational and employment opportunities for women decrease the utility attributed to the family frame (U_{fam}) and increases the utility attributed to alternative frames ($U_{alt)}$). It is important to not simply list the different causal factors but to relate them to each other. Thus, the FST approach emphasizes: only after breaking the monopoly of the family frame for partnerships, increased opportunity costs can become relevant for mass behaviour, since only after weakening m_{fam} the relation between U_{fam} and $U_{alt)}$ becomes relevant.

It needs to be added that, according to the Script Hypothesis, timing decisions are made using rational criteria, even in the case of a family-framed relationship. As expected, the pattern of couples postponing first births until their education has been completed is not an outcome of the demonopolisation of the traditional family model, but can be observed in the past as well as today. The relation between longer periods of education in the course of educational expansion and the trend of delaying family formation is thus independent from changed constellations of sociocultural models. Nevertheless, the process of sociocultural demonopolisation contributes to couples intending not to start a family so that the question of the "right" time for family formation does not even arise.

Note that the recommended theory here does not simply claim an impact of values (or attitudes or preferences). It says that an increased spectrum of life and partnership concepts makes a family framing less likely by making it conditional on clear relationship features or low (opportunity) costs. This is completely irrespective of values. There is a great difference between framing and values. One interprets a situation (does a certain behaviour fit?), the other evaluates a situation (is a certain behaviour desirable?). One is concerned with a "model of reality", the other with a "model for reality" (*Schluchter* 2000: 98, translated by CPoS).[9] A low regard for parenthood or "hedonism" does not prevent the initiation of family framing by certain contextual features of a partnership situation. Conversely, other features of a couple relationship might not allow a family framing, even if the individual desires a family with children. Due to this mechanism, a lack of interest in a family or hedonistic preferences have not prevented that the relations described by *Tyrell* (1988: 154, see section 2.1) came into effect and nearly every functioning couple relationship led to a family in the past days of the monopoly of the family frame. The considered explanation for the historically increasing childlessness is based less on a change of values but rather on the assumption of fading matters of course.

4 Empirical Results

Current controversies surrounding FST concern the question of falsification (*Etzrodt* 2007). It has been stated that FST generally assumes a specific interaction between the weighting of spontaneous model activation and the influence of incentive structures (*Kroneberg* 2008: 268-270). A strong match between situation and frame leads to a lower effectiveness of the utility, costs and opportunity costs of a behaviour. Accordingly, it was hypothesised that there is an interaction between the match of the family frame (which is demonopolised, but still available as a cognitive model) and the opportunity costs (Interaction Hypothesis). The effects of the education level of women on the rate of family formation are commonly interpreted as an expression of higher opportunity costs (*Klein* 1989; *Brüderl/Klein* 1991; *Hill/Kopp* 2006: 213-214). In order to test the assumed interaction of the FST model, it can be analysed *whether the effects of education on the rate of family formation depend on the match between situation and family framing.*

These hypotheses can be investigated employing the German family survey panel. Panel data ensure that documented perceptions precede behaviour. However, the available data does not allow empirically testing the interpretation of historical changes of childbirth behaviour that follows from the theoretical considerations (sub-section 3.3). There are no panel data both covering the relevant period of time

[9] According to the assumptions of the FST-based approach, values can have an influence as factors of the utility parameters U_{fam} (utility of the family frame) and U_{alt} (utility of an alternative frame); however, the utility parameters only influence decision-making if a spontaneous family framing does not occur due to a weak match.

and containing adequate indicators of the relationship situation. The analysed hypotheses (Interaction and Script Hypothesis) are related to the decision on parenthood under increased options of relationship framing. Thus, they apply to the time period covered by the panel, i.e. the period after demonopolisation.

4.1 Data and Method

The German family survey panel comprises 4,997 cases, of which 2,002 were surveyed three times. It contains information on 4,375 relationships (and marriages) that existed in 1988. For the following analyses, only 1,040 relationships, in which both partners were childless at that time, are relevant. The data of the family survey panel refer to West Germany, including West Berlin. The initial survey from 1988 (10,043 interviews) is representative of the West German population aged 18 to 55 at that time.

However, the survey was designed without the theoretical considerations that are of interest to this paper and focused on other research interests than interpretations of relationships. The following analyses can therefore only serve as a preliminary test of the theoretical model. Analyses based on more valid, framing-related survey data still need to be conducted. Moreover, the available data cannot describe situational interpretations dynamically, i.e. their changeability. Thus, the indicators used here (see Table 2) only represent the relationship framing at a certain point in time (the time of the first wave of the family survey), but not the changes of framing during the survey period.

Since, according to theory, the match is determined by the subjectively perceived situational features, the indicators used to identify the match between relationship situation and family frame are the subjective perceptions of respondents regarding their relationship situation, which are collected by the survey. Three variables are selected, which seem relevant for a match of a family-framed relationship: first, the perception of the partnership as a "functioning relationship"; second, the feeling of an emotional bond; and third – as a distinction from primarily couple-centred relationships –a rather moderate importance of sexuality. Precise operationalisations of these variables are illustrated in Table 2. The match of the family frame (m_{fam}) is defined by these three perception criteria. It is important that these variables are not so much indicators of attitudes but rather neutral situational perceptions. They indicate a fit between situation and frame, not an evaluation of the frame. In contrast, the appreciation of family is a factor, which, according to the theoretical considerations above, is independent from the framing effect.[10] It is therefore only used as a control variable in subsequent analyses (operationalised as the opinion that children make life more fulfilled).

Opportunity costs are operationalised via educational success as this is decisive for employment opportunities. An operationalisation via income or employment

[10] The role of values in the framing process is controversial (cf. *Stachura* 2006 and *Etzrodt* 2008).

Tab. 2: Indicators of relationship perception

Variables	Indicators (family survey 1988 and panel)
Perception of the relationship	
a : functioning relationship	Response to the question "[…] which problems occurred in your life during the last 12 months […] – problems with the partner" (translated by CPoS), values: occurred = 0; not occurred = 1
b : emotional bond	Response to the question "To whom do you feel a close emotional bond?" (translated by CPoS), values: partner mentioned = 1; partner not mentioned = 0
c : moderate importance of sexuality	Response to the question "whether the statements apply to you or not. – Sexuality plays an important role in our relationship", values: "Fully agree" = 0; other statements = 1 (translated by CPoS)
$m_{fam} = a * b * c$	

Source: Own design

would ignore the issue of women voluntarily forgoing employment to start a family (*Schröder/Brüder/* 2008). In order to account for the Script Hypothesis posed above, the influence of the education level and the duration of education need to be distinguished. Whereas it is assumed that the effect of the education level on the rate of family formation is dependent on the match of the family frame, the Script Hypothesis postulates that the reduced rate of family formation during education is independent of this match.

The values of the independent variables are collected from the first wave of the German family survey in 1988; information on family formation behaviour is gathered from subsequent panel waves in 1994 and 2000. Thus, for relationships that were surveyed twice, it can be reconstructed whether a child was born in the 6 years between the first and the second wave. For relationships surveyed three times, this is possible for a period of 12 years.

The effects are analysed using the following hazard model:

$\ln h_i(t)$	logarithm of the rate of family formation
$= \alpha_1$	constant
$+ \alpha_2 * t + \alpha_3 * \ln(t)$	(logarithm of the) duration of the relationship
$+ \alpha_4 * A_{Frau} + \alpha_5 * \ln(A_{Frau})$	(logarithm of the) age of the woman (-18)
$+ \alpha_6 * A_{Mann} + \alpha_7 * \ln(A_{Mann})$	(logarithm of the) age of the man (-18)
$+ \alpha_8 * (j-1988)$	calendar year -1988
$+ \Sigma \beta_j a_{ij}(t_{1988, 1994})$	further variables updated in 1994
$+ \Sigma \gamma_k b_{ik}$	further time-invariant variables

The event-analytical models concern the transition to having a common first-born child (family formation of a relationship). The hazard model assumes a non-linear influence of the duration of the relationship (t) and the age (A) of the partners on the

rate of family formation. This is implemented by using both t and ln(t) and, respectively, both A and ln(A). The hazard model can thus be understood as a modification or an extension of the sickle-model (*Diekmann/Mitter* 1984; more extensively *Klein* 2003) and accounts for the sickle-shaped (first rising sharply, then declining) devel-

Tab. 3: Descriptive statistics of the panel sample, childless relationships (N=1,040)

	Total (N=1,040)		Subsample (N=293)[a]	
Parameters (1988)	Mean	%	Mean	%
Duration of the relationship (years)	6.1		9.7	
Woman's age (years)	28.0		34.2	
Man's age	30.8		37.2	
Married		34.3		69.3
Cohabiting		47.4		85.7
Woman's education:				
– Lower School Leaving Certificate/no certificate		27.8		34.1
– General School Leaving Certificate		32.8		33.1
– A-Level		24.0		25.6
– Unknown		15.4		6.8
Man's education:				
– Lower School Leaving Certificate/no certificate		35.4		40.6
– General School Leaving Certificate		21.5		21.2
– A-Level		27.0		31.4
– Unknown		16.1		6.8
Woman in education/training		13.5		2.7
Man in education/training		12.6		3.8
Appreciation of family[1]	0.8		0.8	
Perception of the relationship:[2]				
– functioning		73.2		72.0
– functioning and emotional		68.8		67.9
– functioning, emotional and moderate sexual ($m_{fam}=1$)		57.0		58.7
Female respondent		50.3		51.9
Male respondent		49.7		48.1
Surveyed in 1988 and 1994		66.2		40.3
Surveyed in 1988, 1994 and 2000		33.8		59.7

[a] subsample for the analysis of permanent childlessness: relationships with women aged between 38 and 45 during the survey period

[1] Agreement to the statement "Children make life more intense and fulfilled". "Fully agree" = 1; "Agree" = 0.66; "Disagree" = 0.33; "Fully disagree" = 0

[2] See Table 2 for the operationalisation

Source: German Family Survey Panel 1988-2000, Childless relationships (in 1988); own calculations

opment of birth rates of first-born children with regards to both the course of life and the development of relationships. Besides the variables of interest (education, duration of training or education, match indicator), marital status, the existence of a common household, and an indicator for the appreciation of family (approval of the statement "Children make life more intense and fulfilled", translated by CPoS) are used as control variables. With the exception of the match indicator, which is only collected in the first wave, all variables are updated during the second wave (1994). Shorter observation periods of respondents who were only interviewed twice are accounted for by truncating the data in 1994. The data were further truncated for women at the age of 45. Provided that the relationship started after the partner finished school, the education level of the partner can also be accounted for besides the education level of the respondent. To allow this, relationships that started during the school days of the partner are not included in the analyses. Thus, the number of cases is reduced to 1,040 relationships.

An additional analysis focusing explicitly on effects for continuous childlessness is based on a sample of 293 relationships. Both partners in the relationships of this sample were childless during the first wave of data collection and the respective women reached an age between 38 and 45 during the survey period. In these cases, not starting a family can be interpreted as a permanent renunciation of parenthood. Table 3 illustrates the distribution of the variables in both samples.

4.2 Results

As the odds ratios regarding female education in column (1) of Table 4 show, the data clearly reflect the well-known effects of education on the rate of family formation. This also counts for the low rate of family formation while men and women are in education or training. Column (2) analyses the influence of the perceived relationship. Independent of education, duration of the relationship, and other control variables, a positive effect of perceived relationship on the rate of family formation can be observed. Relationships that perceive a strong match with a family frame lead to a family significantly more often than relationships not perceiving this match.

Column (3) analyses the interaction between the match effect and the impact of education-specific opportunity costs that the FST approach assumes. As hypothesised, a significant interaction effect can be observed for relationships of women with an A-level education. If a strong match of the family frame is present, an A-level education does not have a negative effect on the rate of family formation. In the case of a clear fit of the family frame, opportunity costs become behaviourally irrelevant. Adding up the effects for relationships of women with an A-level education and a strong fit of the family frame, the odds ratio of family formation is (0.454 * 2.372 =) 1.077. Thus, when the family frame fits the situational features, a difference between relationships of women with an A-level education and relationships of women with lower levels of education cannot be found.

This effect of the interaction between the match of the family frame and education only applies to completed education, but not to current training courses. As the comparatively small and statistically insignificant interaction effects in column (3)

Tab. 4: Effects of education, perception of the couple relationship and other factors on the rate of family formation (hazard model, relative risksodds ratios)

	(1)	(2)	(3)	(4)	(5)
Woman's education:[1]					
– Maximum Lower School Leaving Certificate	*1*	*1*	*1*	*1*	*1*
– General School Leaving Certificate	0.766*	0.747*	0.613*	0.547°	0.757*
– A-Level	0.727*	0.721*	0.454**	0.600°	0.438*
– Unknown	0.595°	0.608°	0.585°	0.589°	0.604°
Man's education:[1]					
– Maximum Lower School Leaving Certificate	*1*	*1*	*1*	*1*	*1*
– General School Leaving Certificate	0.925	0.925	0.89	1.012	0.901
– A-Level	1.007	0.998	0.984	0.929	0.99
– Unknown	0.886	0.914	0.896	0.893	0.879
Woman in education[1]	0.59*	0.59*	0.636	0.990	0.577*
Man in education[1]	0.67°	0.67°	0.606	1.292	0.665*
m_{fam} [2, 3]		1.24*	0.89		1.515
m_{fam} * Woman's General School Leaving Certificate			1.434		
m_{fam} * Woman's A-Level			2.372*		3.44*
m_{fam} * Woman in education			0.636		
m_{fam} * Man in education			1.144		
w = appreciation of family[4]	2.827***	2.899***	2.855***	2.524*	2.876***
w * Woman's General School Leaving Certificate				1.476	
w * Woman's A-Level				1.384	
w * Woman in education				0.517	
w * Man in education				0.448	
A_{Frau} * m_{fam}					0.967
A_{Frau} * Woman's A-Level					1.011
A_{Frau} * m_{fam} * Woman's A-Level					0.957
Control Variables:					
Relationship duration[1]	0.878**	0.877***	0.874***	0.878**	0.874***
ln (relationship duration)	3.15***	3.122***	3.16***	3.140***	3.171***
A_{Frau} = Woman's age - 18[1]	0.738***	0.741***	0.733***	0.737***	0.744***
ln (A_{Frau})	19.971***	18.898***	21.642***	20.12***	19.023***
A_{Mann} = Man's age – 18[1]	0.904°	0.905°	0.916	0.904°	0.909°
ln (A_{Mann})	2.363	2.329	2.009	2.390	2.204
Year (-1988)[1]	0.971	0.976	0.978	0.972	0.978
Married[1]	1.681***	1.688***	1.679***	1.683***	1.679***
Cohabiting[1]	1.196	1.21	1.207	1.196	1.215
Base rate	8.937***	9.2***	7.383***	9.027***	9.014***
Log-likelihood	-1072.586	-1071.008	-1067.266	-1071.837	-1067.239
Spells/family formations	5553/304	5553/304	5553/304	5553/304	5553/304

°, *, **, *** level of significance max. 10 percent, 5 percent, 1 percent, 0.1 percent

1 Time-variant variables, which are updated from 1994 onwards; all other variables refer to the base year 1988

2 See Table 2 for the operationalisation

3 No update in 1994

4 Agreement to the statement "Children make life more intense and fulfilled". "Fully agree" = 1; "Agree" = 0.66; "Disagree" = 0.33; "Fully disagree" = 0

Source: German Family Survey Panel 1988-2000; Childless relationships (in 1988); own calculations

illustrate, the main effect of periods of education is not moderated by the framing of the relationship. Thus, periods of education have a negative impact on the rate of family formation, even if there is a strong fit between the perceived relationship situation and the family frame. That a family is generally only started after completing professional training or education is independent from the perceived relationship. This also corresponds to the Script Hypothesis posed above.

Thus, the results in column (3) confirm both the Interaction and the Script Hypothesis. Column (4) indicates that similar relations cannot be shown for the variable indicating the appreciation of family (approval of the statement "children make life more intense and fulfilled", translated by CPoS). In contrast to the match of the family frame, the appreciation of family does not moderate the effect of education. Accordingly, the behavioural relevance of opportunity costs for family formation depends on whether the situation and the frame match – i.e. the compatibility of a family framing – and not simply on the preferences or the values of the individuals.

Regarding the Interaction Hypothesis – i.e. the moderating role of relationship perception on the effect of opportunity costs – it is worth investigating whether this relation depends on the age of the partners. If it is restricted to younger age groups, this would indicate that relationship framing and its impact on the relevance of opportunity costs only applies to postponing family formation. In this case, the process of changed conditions of relationship framing theoretically outlined above would merely be a factor of an increasing postponement of first births to a later stage in life. On the other hand, if this relation also applies to partners reaching the end of their fertility, this would imply that the effects do not only lead to a postponement of family formation but also to permanent childlessness. Column (5) of Table 4 contains a second-order interaction effect indicating whether the interaction between relationship framing and (female) education is moderated by the age (of the woman). As the figures show, no such interaction can be demonstrated. Neither the impact of relationship framing nor the moderation of the effect of education through relationship framing is dependent on the age of the woman.[11]

The logistic regression analysis in Table 5 confirms that the described connections are not only relevant for the postponement of parenthood, but also for permanent childlessness. It analyses the effects of education, perceived relationship and other factors on the probability that a relationship of a woman between 38 and 45 remains childless. This analysis is based on the subsample of 293 couples described in Table 3 which were childless during the first wave of the panel and in which the woman had reached the respective age during the survey period. The odds ratios show that a higher level of education of the woman is positively correlated with childlessness even at an advanced age. The significant interaction effects further indicate that this relation is highly dependent on the match of the family

[11] An alternative analysis (not displayed) calculated the second-order interaction effect using categorical age variables taking on the value 1 if the woman is aged between 39 and 45 and thus indicating that she has reached the end of her fertility. This analysis confirms that the influence of relationship framing (moderation of the effect of education) can be found for older as well as for younger female age groups.

Tab. 5: Effects of education, perception of the couple relationship and other factors on the childlessness of women aged 38 to 45 (logistic regression, odds ratios)

Woman's education:	
– Maximum Lower School Leaving Certificate	*1*
– General School Leaving Certificate	5.051*
– A-Level	6.021*
– Unknown	4.734
Man's education:	
– Maximum Lower School Leaving Certificate	*1*
– General School Leaving Certificate	0.812
– A-Level	1.195
– Unknown	1.842
Woman in education	1.041
Man in education	0.967
m_{fam} * Woman's General School Leaving Certificate	0.133*
m_{fam} * Woman's A-Level	0.153*
Control Variables:	
Relationship duration[1]	1.213°
ln (relationship duration)	0.366°
A_{Frau} = Woman's age – 18[1]	1.512
ln (A_{Frau})	0.138
A_{Mann} = Man's age – 18[1]	1.042
ln (A_{Mann})	0.356
Married	0.452°
Appreciation of family[4]	0.200***
Constant (log-linear)	2.410
Log-likelihood	110.254***
Relationships	293

°, *, **, *** level of significance max. 10 percent, 5 percent, 1 percent, 0.1 percent

1 Time-variant variables, which are updated from 1994 onwards; all other variables refer to the base year 1988

2 See Table 2 for the operationalisation

3 No update in 1994

4 Agreement to the statement "Children make life more intense and fulfilled". "Fully agree" = 1; "Agree" = 0.66; "Disagree" = 0.33; "Fully disagree" = 0

Source: German Family Survey Panel 1988-2000; Childless relationships of women aged 38 to 45 during the period of the survey; own calculations

frame. The odds ratio of permanent childlessness for women with a General School Leaving Certificate is 5.051 times higher and for women with A-level 6.021 times higher than for women with a Lower School Leaving Certificate. In case of a strong match these effects are reduced by the factor 0.133 and 0.153, respectively. Thus, the reduced effects are quite similar to an odds ratio of 1. Hence, an effect of education or opportunity costs cannot be found, if a relationship fits the family frame, even with regard to permanent childlessness.

Overall, the results of the family survey panel confirm the theoretically assumed interdependencies. They confirm the hypothesis based on FST that opportunity cost effects are dependent on the framing of the couple relationship. It is not investigated, though, whether the FST model can empirically explain the historical decline in birth rates. In order to do this, it would be necessary to attribute rates of family formation in different decades to varying relationship framings. Available data, however, only allows for an analysis of subjective perceptions of relationship and their significance for birth rates in recent times. As far as a test of the FST model's assumptions is possible considering available data, these assumptions are supported.

5 Summary and Outlook

As the previous discussion has shown, FST can be the basis for hypotheses on the changed family formation behaviour that include the influence of both cultural-institutional conditions and economic-structural incentive structures and account for their theoretical interrelation. A preliminary analysis is able to prove the assumed interrelation, even if more well-founded analyses based on more valid indicators for perceived relationship frames are still to be carried out. Especially investigations based on more valid indicators and dynamic models of the framing process would be valuable.

However, the empirical results indicate that the FST is a suitable theoretical basis for a consistent and differentiated explanation of increased childlessness. Instead of listing seemingly relevant causes, based on FST, explicit hypotheses regarding the type of interaction between the different factors can be proposed. This was illustrated using the theories of demonopolisation and opportunity costs: if the behavioural relevance of opportunity costs depends on the family framing, the demonopolisation process leads to a greater influence of opportunity costs on relationship-related and family-related decisions.

At the same time, couple relationship context becomes more important. Stable relationships are more than a structural precondition of family planning. Relationship quality and stability determine the extent to which an aspired common parenthood is self-evident. This explains why the rate of family formation is not declining for enduring and stable relationships (*Klein* 2003) and that the desire to have children is often only generated or substantiated on the grounds of a functioning relationship (cf. *Matthias-Bleck* 1996; *Helfferich* 2002: 180-181; *Helfferich et al.* 2006: 184, 188; *Eckhard* 2006, 2010: 39-42, 67-71; *Eckhard/Klein* 2006; 2007: 280-281; 2012). It can

further be concluded that a missing desire to have children should not necessarily be interpreted as an expression of hedonism or low regard for family. According to the presented theoretical considerations, a missing desire to have children is based rather on doubting the appropriateness of becoming a parent in the respective private circumstances, a doubt that has increased due to sociocultural changes.

However, the model is able to provide explanations that go beyond the theories of demonopolisation and opportunity costs. According to the presented considerations, the birth-reducing influence of other factors such as disadvantages of parenthood concerning the standard of living and leisure time (see *Dorbritz*/*Ruckdeschel* 2007), "commitment costs" (*Birg et al.* 1991, translated by CPoS), or risen demands on the role of a parent (cf. *Peuckert* 2008: 120-121) increased during the institutional change. The determinants of frame selection concerning "whether" to start a family and the determinants of behaviour selection concerning "how" and "when" to start a family need to be distinguished. Decision processes regarding the timing of family formation can be assigned to behaviour selection. However, this selection is shaped by frame-inherent script specifications. If a family-framed couple relationship follows the script, which calls for "responsible family planning" and hence for rational birth timing decision, RCT-based models coordinating different goals in life can be used. For example, the concept of reference utility (*Huinink*/*Schröder* 2008; *Schröder* 2007) can model "whether unfavourable circumstances lead to a postponement of a planned parenthood or a reduction in the number of children, or whether goals are realised in spite of unfavourable circumstances" (*Schröder* 2007: 372, translated by CPoS). Besides longer periods of education, another factor to be considered especially regarding "when" – and less "whether" – a family is started is the increasing employment insecurity (*Kreyendfeld* 2008; *Tölke* 2005).

An FST-based model of fertility development can also be used and generalised for intercultural comparisons (cf. *Nauck* 2007). Especially when differences between countries or regions cannot be attributed to divergent economic-structural conditions alone, the question arises whether relevant role models have divergent implications. Considering the persistently different patterns of family formation and family growth in East and West Germany and given the contrasting family policies in the former FRG and GDR this question also applies to the German domestic comparison (*Huinink* 2006: 223, 239-240). In each case, an FST-based approach emphasizes the dependence of incentives on the specific constellations of the sociocultural and situational context.

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